PROJECT INFORMATION MEMORANDUM (PIM)

"Appointment of concessionaire on Design Build Finance Operate and Transfer (DBFOT) with 100% concessionaire investment for the collection, Primary transportation, secondary transportation to Existing processing plants of 1750 TPD"

CLIENTTT

BENGALURU SOLID WASTE MANAGEMENT LIMITED
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RITES: PMC consultant to BSWML to provide Support and services for the SWM-related scope of services defined in the contract between BSWML and RITES

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- National Clean Air Program (NCAP) implementation
- Environment, Social and Governance (ESG)
- Planning & Design of Solid Waste Management
- Source Apportionment Study
- Net Zero (Carbon Neutral) Studies/Carbon Credits
- Environment & Social Impact Assessment studies
- Pollution Abatement Studies
- Lake Conservation Programs
- Extended Producer Responsibility for Single-Use Plastics

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2. Urban Mobility Solutions:RITES has actively worked on urban transport projects, including metro systems and Bus Rapid Transit Systems (BRTS). These projects help decongest city roads, reduce vehicular emissions, and promote the use of public transport, thereby enhancing urban air quality and reducing pollution.

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4. Renewable Energy Integration:RITES promotes the integration of renewable energy sources, such as solar power, into transportation infrastructure. This not only reduces energy costs but also reduces the carbon footprint of transportation facilities.

5. Environmental Impact Assessment:RITES conducts thorough environmental impact assessments for its projects, identifying potential ecological impacts and implementing mitigation measures. This ensures that development occurs with the least harm to the environment.

6. Eco-friendly Technologies:

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7. Environmental Compliance:

The organization adheres to stringent environmental regulations and encourages its clients to do the same. It plays a significant role in ensuring that projects are executed while complying with environmental laws and regulations.

DISCLAIMER

This Project Information Memorandum (PIM) has been prepared by RITES as a consultant for Bengaluru Solid Waste Management Limited (BSWML) to provide an overview of the existing facilities and the status of Construction & Demolition Waste Management and handling processes. The information contained herein is based on field surveys and data collected from BBMP offices.

It is important to note that the PIM is intended to offer a general understanding of the current situation, and the assessment of such facilities shall be an integral part of the Bidder's or Applicant's responsibility. RITES, as the consultant and author of this document, and BSWML & BBMP, do not assume any liability for deviations from the information provided in this write-up. This document is meant to serve as a reference and initial guide for interested parties, and it is recommended that Bidders or Applicants conduct their due diligence comprehensive assessments to ensure accurate and up-to-date information before participating in any related projects or initiatives.

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Project Information

Introduction:

The BSWML acting through and represented by Government of Karnataka and are engaged taking up the scope of services to attain the Garbage free city of Bengaluru by implementing various policies as the MOU. In this connection, BSWML is intend to establish a dedicated mechanism to handle the removal of C& D waste through a scientific Mechanism. To this effect, M/s BSWML appointed M/s RITES Ltd a PSU under Ministry of Railways to prepare inception/Feasibility/ Detailed Project reports to appoint the agency for the Collection and Transportation of the Construction and Demolition (C&D) Waste from various parts of the Bengaluru city. In this context, BSWML advised M/ s RITES to take up two independent studies to prepare the detailed projects reports.

A study report prepared by senior environmental Officer of KSPCB has been taken as the basis to assess the quantities generated in Bengaluru city which has been made in more meaningful with four zones of the city and bifurcated the C&D waste in the zones.

As per the report the quantity statement is as follows:

1)North and Northeast Zone: 2541.00 TPD
2)East and Southeast Zone: 2675.00 TPD
3)West and Southwest Zone : 802.5. TPD
4)West and Northwest Zone: 696.00 TPD.

It is noted that there two existing C&D waste plants are located at Kannur with 750 TPD processing capacity and Chikkajala with 1000 TPD Capacity C&D waste processing plants. Though these plants are established to process the C&D waste, and there is huge quantum of C&D waste being generated but the same is not transported to these existing two plants. These two plants are located at North and eastern part of the city wherein it is estimated that there is about 2501.. TPD is generated. This is due to no established scientific mechanism to collect & Transport. Hence the detailed study has been taken up to establish the scientific mechanism to collect, primary and secondary transportation and its financial implications towards the capital cost, O&M cost and its implications to assess the tipping fee model. Accordingly the Project Information Memorandum has been prepared and the Technical Economic Financial Reports have been prepared.

In order to meet the above objective, M/s RITES have taken up the study towards the assessment of the vehicles required for primary transportation and secondary transportation to transport the 1000 TPD to Kannur processing plant and 750 TPD to Chikkajala processing plant.

Based on the technical parameters, the number of the vehicles for the Primary transportations and for the secondary transportation has been assessed as follows

Primary Collection:

1) 7.5T GVW Vehicles – 43 Number of Hookloaders
2) 5.0 cum capacity containers : 539 Nos

Secondary Collection

1)28.00 GVW Vehicles – 38 Number of Hookloaders
2)20.00 Cum capacity containers: 135 Nos

After arriving the capital cost has be 100% Bidders investment model by paying the tipping fee to the successful bidder.

The bid parameters are arrived based on NITI AAYOG and other best practices available in India have been taken into consideration and a draft RFP and DCA have been prepared for "Appointment of concessionaire on Design Build Finance Operate and Transfer (DBFOT) with 100% concessionaire investment for the collection, Primary transportation, secondary transportation to Existing processing plants of 1750 TPD" (herein referred as "The Project") of Bengaluru City" by seeking private sector participation on Public Private Partnership ("PPP") mode by inviting Proposals for the Project within the [jurisdiction of the Authority] identified locations by BSWML at Bengaluru and on the site(s) identified by the Authority for the implementation of the Project (the "Site(s)") on PPP of Primary & Secondary Transportation to the the existing C&D waste processing plants being operated in the BBMP limits.

Summary

Proposed Minimum requirement of Vehicles for C&T

S No.	Item Description	Capacity	Quantity
1	Primary Transportation Hook Loaders Containers	 7.5 T GVW 5 cum	 43 539
2	Secondary Transportation Hook Loaders Containers	 28 T GVW 20 cum	 38 135

GLOSSARY

ABBREVIATIONS	FULL FORM
BBMP	Bruhat Bengaluru MahanagaraPalike
BCC	Bengaluru City Corporation

BUA	Bangalore Urban Agglomeration
BUD	Bengaluru Urban District
BSWML	Bengaluru Solid Waste Management Limited
BFSI	Banking Financial Services Insurance
CAPEX	Capital Expenditure
C&T	Collection & Transportation
COD	Commercial Operational Date
CPCB	Central Pollution Control Board
CERC	Central Electricity Regulatory Commission
C&D	Construction and Demolition
CBD	Central Business District
CPHEEO	Central Public Health and Environmental Engineering Organization
CSR	Corporate Social Responsibility
DTC	Demolition and Transportation Contractor
DPR	Detailed Project Report
DBFOT	Design Built Finance Operate and Transfer
DBO	Design, Build, Operate
DWCCs	Dry Waste Collection Centers
EPC	Engineering, Procurement, Construction
GPS	global positioning system
GVP	Garbage Vulnerable Point
GHG	Green House Gases
G.o.K	Government of Karnataka

GoI	Government of India
GVW	Gross Vehicle Weight
HZ	Hitachi Zosan
IEC	Information, Education, and Communication
IT	Income Tax
KCDC	Karnataka Compost Development Corporation
KSERC	Karnataka State Electricity Regulatory Commission
KLD	Kilolitres per Day
MAT	Minimum Alternate Tax
MoHUA	Ministry of Housing and Urban Affairs
MTS	Mini Transfer Station
MW	Megawatt
NGO	Non-Governmental Organizations
O&M	Operation & Maintenance
OPEX	Operational Expenditure
PPP	Public Private Partnership
PMC	Project Management Consultancy
RITES	Rail India Technical and Economic Service
RWAs	Residential Welfare Associations
SERC	State Electricity Regulatory Commission
SPCB	State Pollution Control Board
SHG	Self-Help Group
SCT	Secondary Collection and Transportation
SWM	Solid Waste Management

TPD	Tonnes per Day
ULB	Urban Local Bodies
UDD	Urban Development Department
UN	United Nations
VGF	Viability Gap Fund
WMD	Waste Management Department
YoY	Year on Year

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CHAPTER -1 INTRODUCTION

1.1 Understanding of the Project:

The Construction and Demolition (C&D) waste management and utilization strategy is intended to help facilitate the implementation of the C&D Waste Rules 2016 to ensure that ULBs across the country can adopt proper C&D waste management and that recycled products find appropriate and adequate utilization. Although India produces enormous amounts of C&D waste and volumes are expected to grow further with time, there are no reliable estimates of generation volume, either at the local or national level. Management of the waste has historically been poor, with a very small fraction diverted for reuse and the rest dumped, often in an unauthorized manner, causing myriad environmental problems.

Due to rapid urbanisation, India's construction sector is projected to grow at a rate of 7-8% over the next 10 years[1] and is likely to become one of the largest contributors to the Indian economy. The growing Construction and Demolition (C&D) waste problem in Bengaluru, India's tech capital, poses significant environmental and urban management challenges. Addressing this issue requires a multi-faceted approach involving government authorities, urban planners, technology experts, and the construction industry.Thousands of tones of construction and demolition waste are illegally dumped at open sites, along roads and on lake beds.Hence BBMP/BSWML is assessing the scientific mechanism to collect, transfer, transport and dispose at the assigned C&D waste processing plant to avoid un-authorized dumping.

The Bengaluru Solid Waste Management Limited (BSWML) intends to select a suitable concessionaire for carrying out the work relating to the collection and transportation of Primary & Secondary Transportation to the three existing C&D waste processing plants being operated in the BBMP limits.

The increase in the number of buildings, expansion of urban infrastructure (such as roads, bridges, flyovers) and demolition of old buildings has also resulted in immense amount of waste being generated in the form of debris, building materials etc. and this trend will further increase in the decades ahead. While accurate estimates of construction and demolition waste generation in the country are not known, the "Utilisation of Recycled Produce of Construction & Demolition Waste - Ready Reckoner 2018" released by the Buildings Materials & Technology Promotion Council (BMTPC), Ministry of Housing and Urban Affairs (MoHUA) estimates that 100 million MT of C&D Waste is generated in India annually.

The Ministry of Environment, Forest and Climate Change (MoEFCC) notified the Construction and Demolition Management Rules in 2016 for all ULBs to develop effective strategies for C&D waste streams as cities are continuously building and expanding infrastructure and built spaces.Most cities do not have formal demolition

permits and developers hire local contractors for demolition. Even government agencies like PWD invite bids for demolition based on what contractors would pay for recoverable. The recoverable of immediate secondary market value, such as metal rods, pipes and fixtures, wooden frames, etc., are salvaged by the informal sector, typically from demolition sites, leaving behind the "rubble" composed of bulky materials such as concrete, stones, bricks and mortar, etc. A small fraction of this rubble is used for back-filling in construction projects, both for private projects and public works, and the same demolition contractors arrange for its transportation to sites where it is needed. It is estimated that such uses may account for only 10-30% of generated C&D waste depending on the site and region. The remaining fraction of C&D waste is disposed, either in designated landfills/dump sites or often in unauthorised places such as road sides, river beds and low-lying areas causing a host of nuisance, safety and environmental problems.

The following are some of the key challenges associated with the existing system of municipal solid waste management.

1.2 Assessment of Challenges and Roadblocks

There remains a host of challenges and roadblocks faced by both government agencies and the private sector that are hindering a wider and quicker adoption of C&D waste management initiatives. It is important to properly understand these challenges so that proposed actions can target them effectively.

Construction and Demolition Waste (also referred to as C&D Waste) is defined by the C&D Rules as the waste comprising of building materials, debris and rubble resulting from construction, remodelling, repair and demolition of any civil structure. The activities that mainly generate C&D Waste are

i. construction of new buildings,
ii. renovation of existing buildings
iii. demolition of old buildings
iv. excavation/laying of asphalt/concrete roads
v. installation and service of public utilities (telephone/water/electricity/sewage pipelines)
vi. construction/renovation of public infrastructure (bridges/flyovers).

Municipal bodies/Local authorities

Local authorities/municipal bodies have the most important role in planning and implementing C&D waste management in their respective jurisdictions under the 2016 Rules. Even if the collection, transport and processing are contracted out to a private entity, the local authority is ultimately responsible for the overall performance of the management scheme. However, local authorities/municipal bodies appear to be the

weakest link hindering rapid adoption of initiatives and facing several challenges. Several factors are responsible for this, including:

a) City officials may understand the broader aspects of C&D waste management but require support to develop tailor-made solutions to their specific circumstances
b) Cities do not have adequate capacities and trained personnel to take up the initiatives
c) Cities do not have the financial resources to hire a consultant for an initial feasibility study and/or a DPR
d) Cities are not convinced how the business case would work in their circumstances and are apprehensive about the model being a drain on their budget
e) C&D waste management is considered a low priority (the public is more concerned about MSW), especially in the absence of strong coordination/facilitation by state-level agencies.

Land shortage

Indian cities are densely populated and poorly planned concerning infrastructure and necessary civic amenities, hence land shortage is a universal problem. The situation is particularly acute in larger cities where satellite towns are spread all across their borders. Setting up any kind of waste management/recycling facility requires a significant amount of land, and that too in zones sufficiently far from residential areas. Many large cities are already struggling to identify appropriate land for MSW management, let alone CDW management which is seen as less urgent. Often, the only feasible option for a large enough land parcel is outside the borders of the municipal body which requires effective collaboration with other entities, especially state government-level departments/agencies. Even identifying smaller land parcels needed as intermediate C&D waste collection centers throughout the city/town is a challenge.

Lack of monitoring capacity/resources

Local authorities/municipal bodies typically suffer from chronic shortages in personnel and resources. They are hard-pressed to monitor, collect and dispose of MSW adequately, a matter of greater concern to the public, and initiating a new C&D waste management system is an additional responsibility to them for which they feel unprepared. Most cities do not have demolition permits and therefore demolition sites and practices are poorly monitored, if at all. An ideal management plan would require the creation of a new C&D waste monitoring system, as envisioned by the 2016 Rules, for which effective coordination would be required between the ULB's Building Department and the Waste Management Department.

Lack of capacity and experience in C&D waste management

In addition to the overall capacity/resource issues, C&D waste management is a relatively new topic that many municipal officials have little awareness or experience of. Experience shows that even after capacity development workshops are held, local

authorities/municipal bodies are unsure of how to proceed with waste estimation, feasibility planning, tendering and so on. In many cases, inexperience or prior negative experience with PPPs may be an additional cause of hesitation. The ability to hire a consultant for a feasibility study is limited by funding shortages; even when consultants are hired there is sometimes no guarantee that they will provide appropriate guidance.

Concern about finances and business case

Due to chronic financial pressures, local authorities/municipal bodies are instinctively wary of any new commitments that appear to them as a new source of expenditure. The tipping fee paid to the contracted party by the ULB is seen as an unjustified burden when in reality it may not be a net expense given that: a) the ULB saves money by not having to haul bulky C&D waste, and b) the 2016 Rules allow the ULB to impose charges on waste generators; tipping fees can be paid from this revenue. In some cases, urban officials have even proposed that the contracted party pay the ULB rather than receive a tipping fee for each tonne of C&D waste, and/or share profits from selling recycled products with the ULB. Not surprisingly, this deters potential investors since recycled C&D waste products are still a nascent market in India.

Lack of urgency/priority

In many cities/towns, even preliminary discussion and planning have not happened on C&D waste management, while in others progress has stalled after preliminary discussions. C&D waste management is seen as a low priority, in the context of the overall shortage of personnel/resources. MSW disposal is of greater concern to the public and there have been MSW-related lawsuits in many cities. As a result, MSW collection and disposal is treated as a higher priority.

1.3 Private sector/Construction industry

The construction industry also has an important role to play – both in ensuring that their generated waste is disposed of properly and in gradually increasing the adoption of recycled products in construction practices. Larger players should ideally adopt significant in-situ utilization of C&D waste in their projects, wherever feasible, and could consider investing in processing facilities as a business option.

Lack of awareness and concern The construction industry is entrenched in its ways and is historically used to turning a blind eye to how C&D waste is disposed of; getting them to change their ways is likely to be a difficult and gradual task. At the same time, there is little awareness about C&D waste recycling and utilization beyond using rubble as a filling material.

The dominance of the unorganized sector in demolition

The demolition sector is overwhelmingly dominated by small players in the unorganized sector, the only exception being a handful of specialized companies whose niche is high-tech demolition related to large infrastructure projects. This naturally makes it difficult for urban officials to monitor and regulate small demolition contractors who are typically not registered and are used to getting away with disposing of C&D waste in unauthorized locations.

Lack of confidence in recycled products

The experience in Delhi and Ahmedabad has shown that the market for recycled products made from C&D waste is still quite weak in India. Engagement with the construction industry repeatedly demonstrates that potential buyers are hesitant about recycled products that they perceive to be inferior in quality. Even when informed about the updated BIS standard (383) that allows recycled aggregates in many applications, potential buyers appear risk averse, pointing to their clients who seem to prefer "conventional" products.

Poor economic viability of recycled products

Currently, aggregates are taxed at 5% and manufactured products are taxed at 18% making the use of recycled products economically unviable for customers. GST relaxation for C&D waste recycled products including manufactured products such as tiles, paver blocks, bricks, sand and aggregates may be considered.

1.4 State Government agencies/Departments

While local authorities/municipal bodies have the most important responsibility in planning and implementation of C&D waste management, state government agencies and departments can often play a crucial role in ensuring proper coordination and paving the way for successful implementation.

Low involvement of state urban departments

State urban departments are supposed to frame policies on C&D waste management, supplementing the 2016 Rules, to help implementation taking local context into account. Moreover, the active involvement of state urban departments (sometimes, with other related agencies) may be needed for suitable land identification and dedication for establishing waste processing facilities, as outlined in section 5.1. In most cases, their engagement has been poor; C&D waste management appears to be a low-priority issue.

Low engagement by public construction agencies

State government agencies such as PWD, Housing Development Board/Authority, City Development Authority, public sector utility companies, etc. are involved in significant construction/demolition work. As per the 2016 Rules, these entities are supposed to coordinate with local municipal bodies about the proper disposal of their C&D waste,

implement in-situ utilization of C&D waste in their projects wherever feasible, and adopt policies to buy recycled products. However, engagement has remained weak, partly as a result of coordination challenges between state and local government-level entities.

At present the by-products of frenetic construction activity, including infrastructure development, are on display in various proportions at roadsides and once beautiful lakes. The existing C&D waste plants located at Chikkajala and Kannur with capacity handling of 750 TPD and 1000TPD. 750 TPD at Kannur and 1000 TPD at Chikkajala, but the waste that reachesthe two plants is not even 10% of its capacity due to insufficient raw material receipt, hence the scientific mechanism is proposed to collect and transport C&D waste.

The Present Transport mechanism is also under numerous packages that are under the purview of BBMP. The managing of these packages without having any Transfer Station facility resulted in a haphazard way of transporting from Primary C&T to the Secondary Transportation Vehicles, Either on theroadside or at public places.

1.5Bengaluru urban district

Bengaluru is the capital city of Karnataka, which is also the Headquarter of the Bengaluru Urban District located on the Deccan plateau at an elevation of approximately 920 meters (3,018 feet) above sea level in the south eastern part of Karnataka. Bengaluru urban district is spread across 4 Talukasnamely Bengaluru North, Bengaluru East, Bengaluru South and Anekal. , Bengaluru is renowned and well known as the "Silicon Valley of India" due to its prominent role in the field of information technology and innovations. Bengaluru has a rich history of ancient times and was part of various dynasties, including the Cholas, Hoysalas, and Vijayanagara Empire. The city's modern development, however, gained momentum during the British colonial period. It served as a cantonment area and administrative center for the British, contributing to its urban growth as well.

The regions exhibit two primary types of soils i.e. red loamy soil and lateritic soil. Red loamy soils are typically found on hilly to undulating slopes in granite and gneissic terrains, predominantly in the eastern and southern parts of Bangalore. On the other hand, laterite soils are present on undulating terrain, creating a flat to gently sloping topography in the peninsular gneissic region.

The climate in Bangalore is moderate, with relatively mild temperatures (ranging between 16°C to 32°C) year-round due to its elevation. Summers (March to June) are warm, while monsoons (June to September) bring heavy rainfall. Winters (October to February) are cooler and more comfortable, making it an attractive destination for visitors.

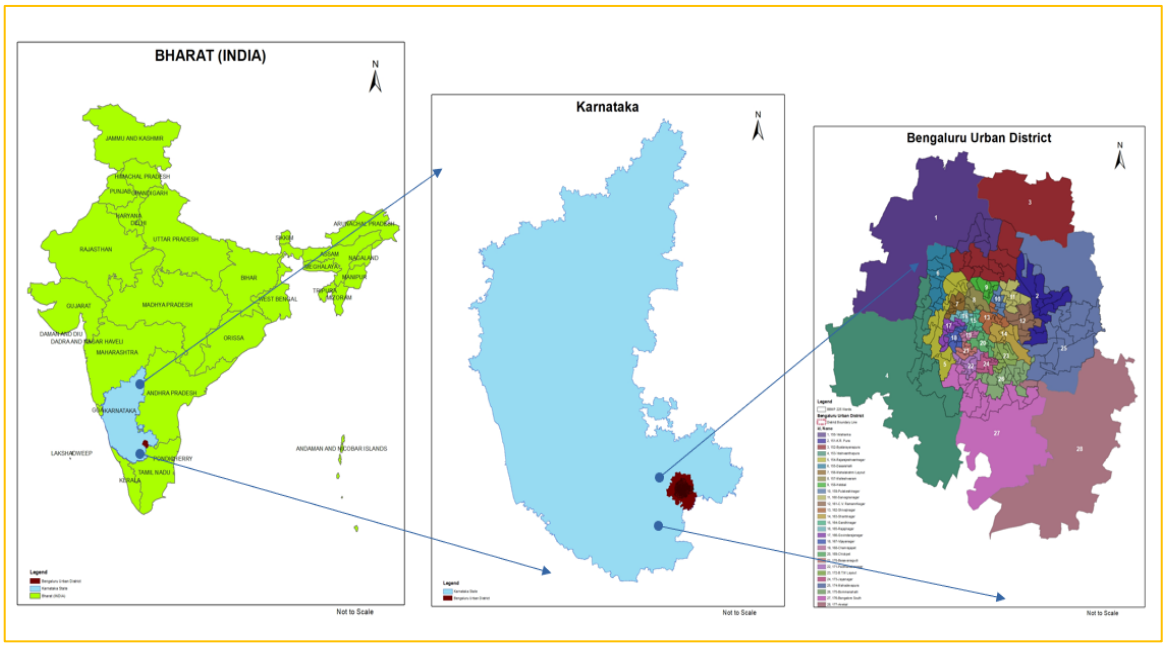


Figure 1: Map of Bengaluru Urban District

1.6 Existing C&D waste management plan

At present there is one C&D processing plant owned by BBMP/BSWML at Kannur which has having capacity of 750TPD processing capacity daily and another processing plant capacity of 1000TPD at Chikkajala and both are operated by M/s Rock-line. Though the processing capacity of both plants is about 1750 TPD daily it is not able to operate not even 10% of the total processing capacity. One of the reasons is due to lack of a standard transport mechanism.

Assessment of the C&D waste Generation: Though there are many assumptions available to assess the C&D waste generation, there is no yardstick to define the volumetric quantity of the C&D waste hence a detailed study has been conducted by the Karnataka State Pollution Control Board during the year 2020-2021 to establish the existing C&D waste generation and its impact has been assessed.

As per the above said detailed study, it has been noted that about 6800 TPD of C&D waste is being generated daily in BMA limits and this C&D waste is being handled through an un-organized sector to be carried through the non-regularized vehicle in open trucks and dumped in open areas, adjacent to storm water drains and in lakes.

The trucks being deployed by private agencies are not meeting any regulations and nor are they carrying to any defined disposal sites or neither disposing at existing plants.

As per the KSPCB study report (list attached) over the last 30 months i.e. from 1.1.2020 to 31.7.2022, Bengaluru generates about 6700 Tons of C&D Waste per day. Seen that during the peak of Covid such developmental activities have taken place. The estimated quantity is based on the physical verification of some of the dumping lots and based on the earmarked sites for the demolition (Le meridian Hotel etc.). based on the calculations the estimated C&D waste is being generated in Bengaluru city is about 7000 Tons per day. At least 70 to 90% of this waste can be processed, however, it ends up in landfill, storm water drains or lake beds.

Based on the above-said detailed assessment, It shall be seen that the generation of waste is more towards the North, North East, East, South East and Southern parts of Bangalore and moderate towards the South Western part of Bangalore.

At present, there are two C&D processing plants with a capacity of handling 1000 Tons/day at Chikkajala and 750 TPD at Kannur. Despite, the city generating 6700 (7000) Tons/day of C&D waste, the unit shall be operating at only 10 per cent of its capacity due to insufficient raw material receipt. One of the main reasons for this is the distance criteria of the location of the processing plant and unorganized disposal system.

From the total estimated C&D waste of 6700 TPD, a portion of the C&D waste can be planned to transport to the existing Plants located at northern part of the Bengaluru city which are having 1000 TPD capacity plant at Chikkajala and 750 TPD plant at Kannur through dedicated transportation mechanism from the Northern of Northeastern parts of the cityand the balance can be planned to establish with collection, transfer, transport and process under single window mechanismin the Packages.

Hierarchical Mapping of Bengaluru City

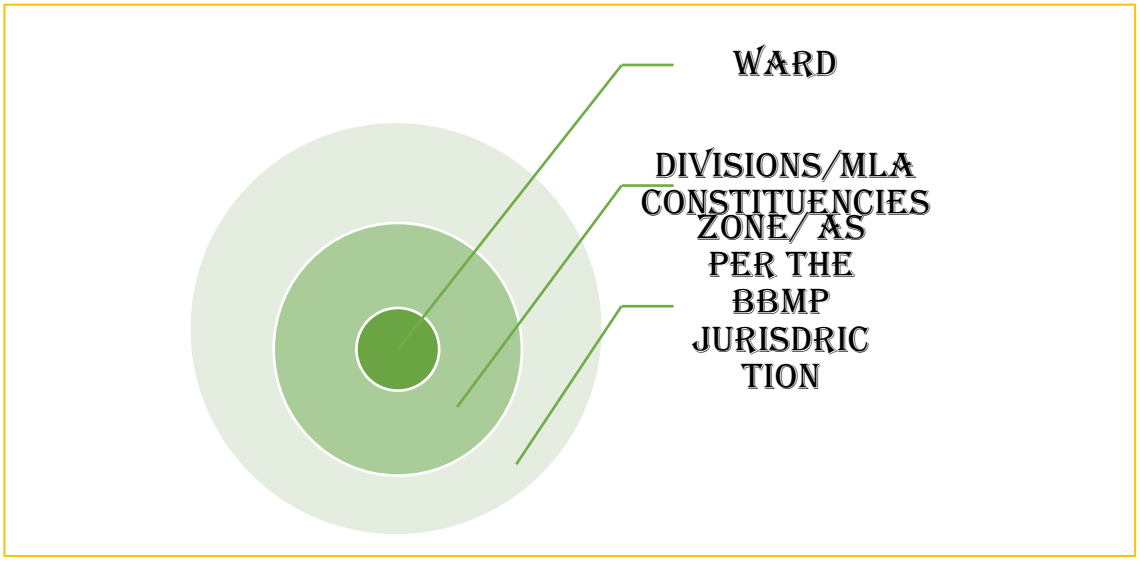


Figure 2: Hierarchical Mapping of Bengaluru City

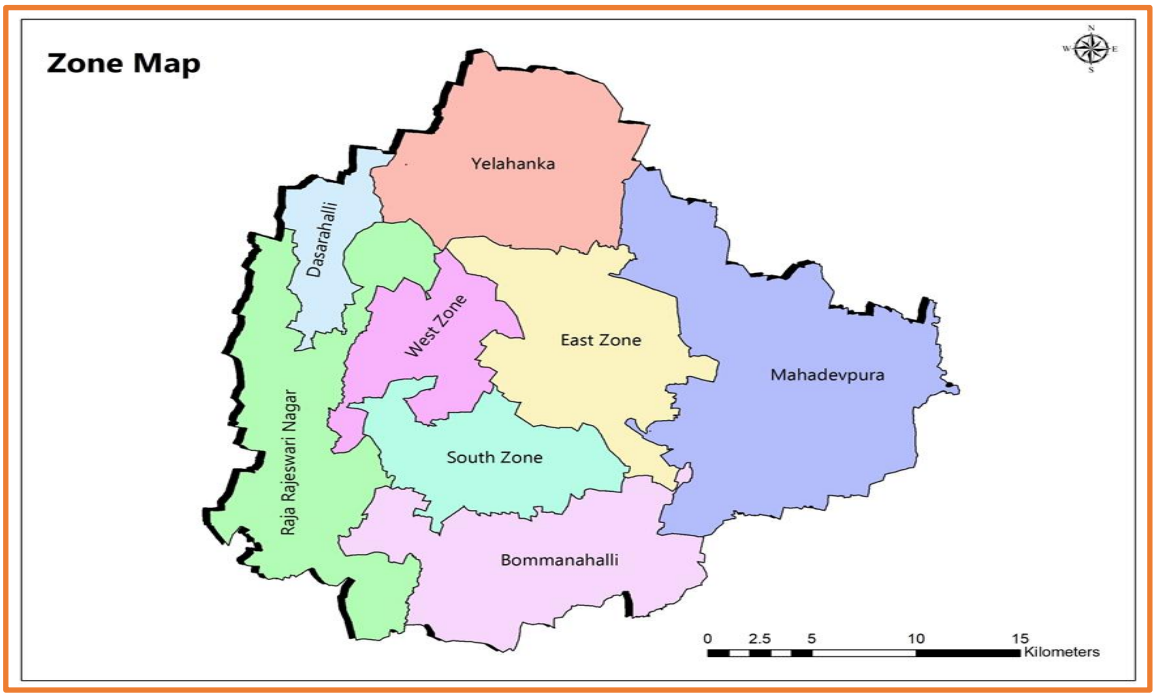


Figure 3: Zone Map

Formation and Jurisdiction: BBMP was formed in 2007 by merging the Bangalore Mahanagara Palike (BMP) with several surrounding municipalities and panchayats. This merger was intended to create a single administrative body for the entire urban area of Bangalore.

Administrative Structure: BBMP is headed by a Mayor who is elected by the members of the BBMP Council. The council consists of elected representatives called corporators, who are elected by the residents of various wards within the BBMP's jurisdiction.

Bruhat Bengaluru MahanagaraPalike is headed by the ChiefCommissioner who is appointed and deputed by the State Government of Karnataka to perform duties and functions of municipal corporation such as

- Urban planning and development.
- Road and transportation infrastructure.
- Water supply and sanitation.
- Waste management and garbage collection.
- Health and hygiene services.
- Property tax collection.
- Birth and death registration.
- Building permits and regulation.
- Parks and green spaces maintenance.
- Challenges and Development Initiatives.

Bangalore has experienced rapid urbanization and population growth, leading to various challenges such as traffic congestion, infrastructure development, and environmental concerns. BBMP has initiated several projects and programs to address these challenges, including the development of the metro rail system, road expansion projects, and efforts to improve waste management and green spaces.

- *Political Structure*: BBMP is governed by a council with a mix of elected representatives from various political parties. The political landscape may change with each municipal election.
- *Finances:* BBMP's revenue primarily comes from property taxes, grants from the state government, and other sources. Managing finances and ensuring adequate funds for infrastructure development and services is a critical aspect of BBMP's responsibilities.

Recently government passed the resolution to collect the user fee from the domestic waste generators and commercial waste generators (other than the Bulk Waste Generators) through BESCOM through monthly electricity bills for adequate solid waste management within BBMP Limits and fix service charges to BESCOM.

1.7 Bengaluru Solid Waste Management Limited (BSWML)

Bengaluru Solid Waste Management Limited (BSWML) is a government-owned company / exclusive set up made by the Bruhat Bengaluru MahanagaraPalike (BBMP) to implement and execute specific solid waste management (SWM) projects to deliver efficient and affordable Integrated Solid Waste Management Project / Infrastructure to the citizens of Bengaluru. Thus, BSWML is the project implementation and monitoring authority for the proposed project.

Bengaluru Solid Waste Management Limited is chaired by the Additional Chief Secretary of the Government of Karnataka (G.o.K)/ UDD. The Chief Commissioner/BBMP is the Managing Director. The Special Commissioner (BBMP - HQ) is the CEO of the BSWML. There is a Board of Directors constituted as per the rules of the company. The Chief Engineer and the Chief General Manager (Tech) are the technical head of the BSWML associated with Engineering staff at various ranks. The overall Technical matters shall be reviewed through the technical committee appointed by the company as per the extent of the rules.

1.8 Project Management Consultant to hand in hold BSWML to provide support and services

RITES LTD is a ‘GO-TO’ infrastructure consultancy company that is dedicated to creating sustainable and efficient infrastructure solutions. RITES approach is to innovate and adopt systems underpinning the transition to a low-carbon future.

In pursuit of improvising and providing continuous best of services in the field of Solid Waste Management and intends to focus on resource recovery at every stage of solid waste handling and disposal, M/s BSWML appointed M/s RITES Ltd for the Project Management Consultancy (PMC) services to hand hold M/s BSWML by providing the technical support to address the issues on Solid Waste Management (MSW) and to implement appropriate solutions to avoid the landfills by adopting various technologies to process to mitigate the problems being faced by Bengaluru.

1.9 Bengaluru Real Estate Market Profile:

The real estate market is vibrant and comprises of Office, Residential, Hospitality and Warehousing sectors. The office space is drivers are It and ITES sectors, the BFSI, manufacturing and other services.

Table 1: Business District of Bengaluru

Sl.no	Business District	Areas /Locations
1	Central Business District and Off CBD	MG Road, Residency Road, Cunningham Road, Lavelle Road, Richmond Road, Infantry Road,
2	Sub Urban Business District	Indiranagar, Koramangala, Airport Road, Old Madras Road,
3	Peripheral Business District East	Whitefield
4	Peripheral Business District North	Yelahanka, Devanahalli, Bellary Road
5	Peripheral Business District South	Electronic City, Bannerghatta Road
6	Outer Ring Road	Hebbal-Manayata, Marathahalli, Sarjapur

Supply And Demand Position

Bangalore stands at the third position and as market leader in leasing of commercial space in the country with about 96 Million square feet (2016) of grade A non-captive office space. The city has around 40 million sq ft of real estate space in different stages of planning and construction which is expected to be delivered in next five years. About 6.0 -7.0 Million Square feet of space is leased annually of the available supply.

Bengaluru, is driving office space absorption in the country, maintaining its Silicon Valley status and has recorded the highest absorption of 15.3 million square feet (1.4

million square metres) in 2017 and is likely to see around 14 million square feet (1.3 million square metres) absorption year-on-year (YoY) for the next three years. The current trend reflects a robust market. Bengaluru has seen a significant increase of 20 per cent from 2016, when the city had witnessed a gross absorption of 12.8 million square feet (1.18 million square metres) and this is attributed to the increase in absorption primarily to the expansion by technology occupiers, contributing 56 per cent of the total demand. Banking, financial services; insurance (BFSI) and engineering; manufacturing followed with 11 per cent and 9 per cent share, respectively.

About 26 million square feet (2.4 million square metres) of Grade A office space is scheduled for completion in Bengaluru by 2020. More than 60 per cent of the total upcoming space is concentrated in ORR and Whitefield, while the rest is distributed across micro markets such as north (10 per cent) and SBD (7 per cent). The upcoming supply is expected to complement the increased demand in ORR, Whitefield and emerging micro market of North Bengaluru.

As of 2017, it is estimated that only about 3-4 % vacancy exists in the city's office market. New supply should improve, especially in the much sought after ORR and alternate peripherals failing which occupiers may opt to other competitive hubs in the long term.

Niche Office Real Estate products such as co-working spaces accounts nearly for 6 % of the Office space transactions. Companies specializing in automation, AI, data analytics, cloud computing and robotics are attracted to establish and expand in Bangalore. The real challenge will be to ensure adequate and timely supply in prominent micro markets.

The share of affordable housing in Bengaluru's residential supply, too, has risen dramatically in the last two years, increasing from 16% in 2016 to 25% in 2018

Summary:

- The Master plan for Bengaluru anticipates a population of over 2.0 Crore by 2031. While this may be very high, it would be reasonable to assume a steady increase of population in range of 1.80 Crore. The city has highest number of INR 1.0 Million per captia earners in the country and the economic outlook looks positive. The institutional base in the city complements the growth of services industry, high technology and start up. The city attracts huge FDI share of the country.

- The city has about 1.3 Crore square feet of quality space in the commercial sector of real estate, with lowest vacancy levels in the country. The developments are predominantly in the east and ORR. The release of space in the centre of city and the suburban areas are getting addreesing the need by adding additional constructiona areas on a rapid manner to meet the demand.

- Residential sector has been growing at steady pace – the overall inventory available in the city is moderate and the demand for affordable housing is significant. Bannerghatta road, Hosur Road, Eastern Parts followed by the North side towards the Airport is picking up.

By considering the demand and supply of real estate requirement, the city expected to increase the requirement of construction activities thus it is expected to drastically increase generation of the volume of the construction and demolition waste.

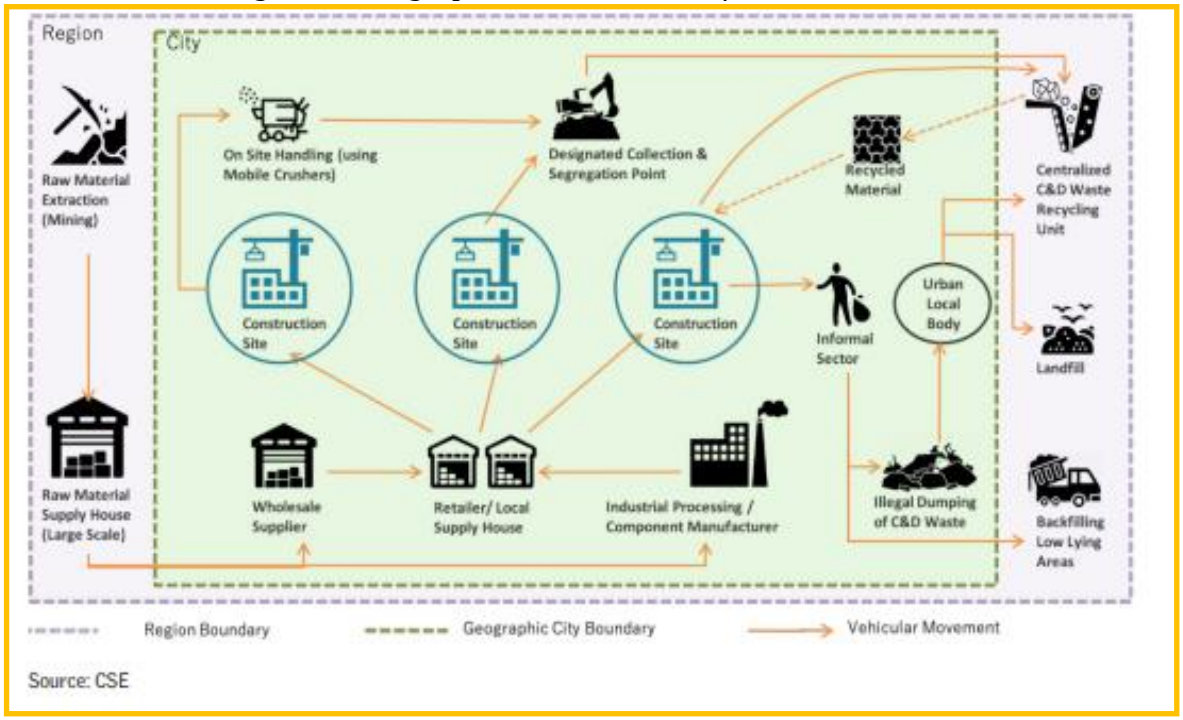
The present status indicates that the scientific management of Municipality waste has been one of the major concerns for Urban Local Body (ULB)- Bengaluru. Though BBMP has implemented many programmes and issued many guidelines, and Swatch Barat Mission programme of vision of India to clean the cities however, despite BBMP focus on the principles for SWM Slogan of 3R (Reduce, Reuse, Recycle), the implementation programmes with the active engagement of the citizens of the city, there still considerable scope to recover value from waste.

The forward message of the Secretary MOHUA has indicated while releasing the guidelines on Circular Economy in Municipal Solid Waste and Liquid Waste that there is possible by adopting a circular economy approach which is central to achieving the vision of a clean India. Circular Economy solutions are embedded in the concept of generating zero waste through innovations that can utilize discarded materials to produce reusable and recyclable products.

This report is attempts to provide the insight understanding and approach to create a comprehensive assessment of the rate to be collected as fees from the source generator to pay towards collection, transportation and processing of C&D waste.

- China-In 2019, China produced 2,300 million tons of C&D waste, making it the world's largest producer.
- Emerging countries-China and India are major contributors of C&D waste.
- Global production-C&D waste accounts for more than 30% of the world's total solid waste. By 2021, the annual C&D waste is reported to exceed three billion tons.
- Urban areas-Demand for residential and commercial buildings in urban areas drives construction activities.

Figure4 : Geographical Distribution of C&D Activities



Environmental problems-C&D activities can cause environmental problems such as the diminishing landfill space, depleted building materials, Increased contamination from landfills and damage to the environment.

C&D waste issues are more important for the developing countries, which are entering or already entered in construction boom era. Many countries do not have specific regulations designed for C&D wastes, although some countries include some sections in their solid waste management regulations & related policies. It was also pertinent to mention here that very small % of waste from construction industry is reused or recycled, the majority being deposited or used as landfill. Like other developing countries, India is also enjoying construction boom. With the rapid growth in construction activities of India it is appropriate to link the generation of C&D waste with the growth of construction industry and related issues.

1.10C& D WASTE GENERATION IN INDIA AND ITS QUANTIFICATION METHODS

The construction sector was the second largest sector in India in terms of material consumption in 2007. With an increase in absolute material consumption by more than one billion tonnes, the construction sector was the fastest growing sector between 1997 and 2007 (TERI et al., 2016).

In the absence of a more detailed methodology, municipal authorities may use the TIFAC Thumb Rule6, as a rough guide for approximate estimation. The thumb rule estimates C&D waste generation based on the area being constructed/demolished as set out below:

- Construction: 40 – 60 kg is generated per m2 of construction
- Renovation and repair work: 40 – 50 kg is generated per m2 of renovation and repair work
- Demolition of pucca building: 500 kg is generated perm2 of demolition of pucca building
- Semi-pucca buildings: 300 kg is generated perm2 of demolition of semi pucca building

The Local Authorities will need to know the exact area of buildings/projects that will undergo construction/demolition to adopt this methodology for C&D waste quantification. Therefore, the Local Authorities will need to link building and development permits to establish C&D Waste generation database and monitoring of compliance by the waste generators.

The typical composition of CDW in India is shown in Figure -- (TIFAC, 2001).

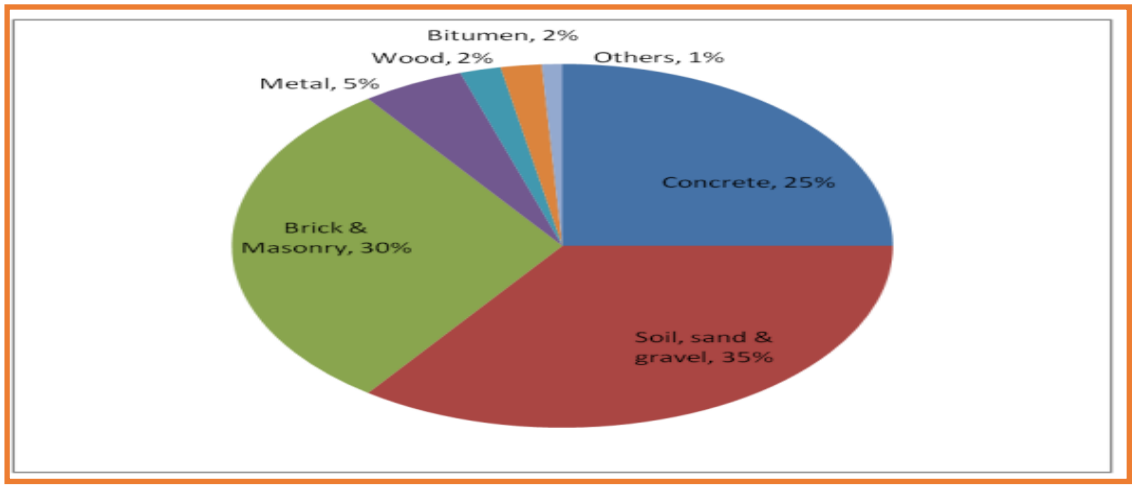


Figure 5:Composition of CDW in India

Of the total CDW generated, approximately 50-60% is easily amenable for reprocessing. This primarily includes concrete, bricks and masonry fractions. These fractions can be crushed and used as coarse or fine aggregates depending on user demand. Soil, sand and gravel can also be reprocessed for productive use as fine aggregates, but with more investment in separation and processing.

CHAPTER -2 :BENGALURU– CONSTRUCTION & DEMOLITION WASTE PROFILE

2.1 Over View of Existing Scenario of C&D Waste

- Karnataka State Pollution Control Board (KSPCB) conducted a detailed study and assessed the generation of C&D waste base of the field survey held during 01.01.2020 to 28.06.2021.
- The study was conducted on each ward under each zone.
- The nature of the project and detailed out based on the layout development and individual construction
- The average C&D waste generation for the new construction as per the CPCB norms It shall be 40 to 60 KGs per Sqm of BUA which is average of 50 Kg/Sqm.
- The nodal officer under his guidance a dedicated team has been established to assess the C&D waste and the calculations based on the team is placed at annexure. The summary of the C&D waste generation based of KSPCB assessment from the below table is about 6715.03 TPD

Table 2: C&D waste generation based on KSPCB assessment

NO	PARTICULARS OF BENGALURU	C&D WASTE GENERATED IN TONNES
1	Data of Consents accorded 1.1.2020 to 31.7.2022 (30 Months) by KSPCB	2810943.11
2	Smaller projects less than 175 Flats or less than 2.75 L SFT (considered as 50% of above, as they are more in number)	1405471.56
3	Demolition of buildings (can be considered 10% of the total buit up. Example one Le Meridian Hotel demolished a 10 Lakh SFT of building)	421641.47
4	The public works, metro and smaller independent repair and demolition at 50% of the major projects	1405471.56
5	TOTAL C&D WASTE GENERATED IN 30 MONTHS	6043527.70
6	AVERAGE TONS OF C&D GENERATED PER MONTH	201450.92
7	**AVERAGE TONS OF C&D GENERATED PER DAY**	**6715.03**

2.2 C&D waste generation Jurisdiction

The total assessed C&D waste within BMA jurisdiction has been dived into 4 zones by dividing the BMA layout with central Axis-X and Axis-Y. The illustration has been shown in the figure below.

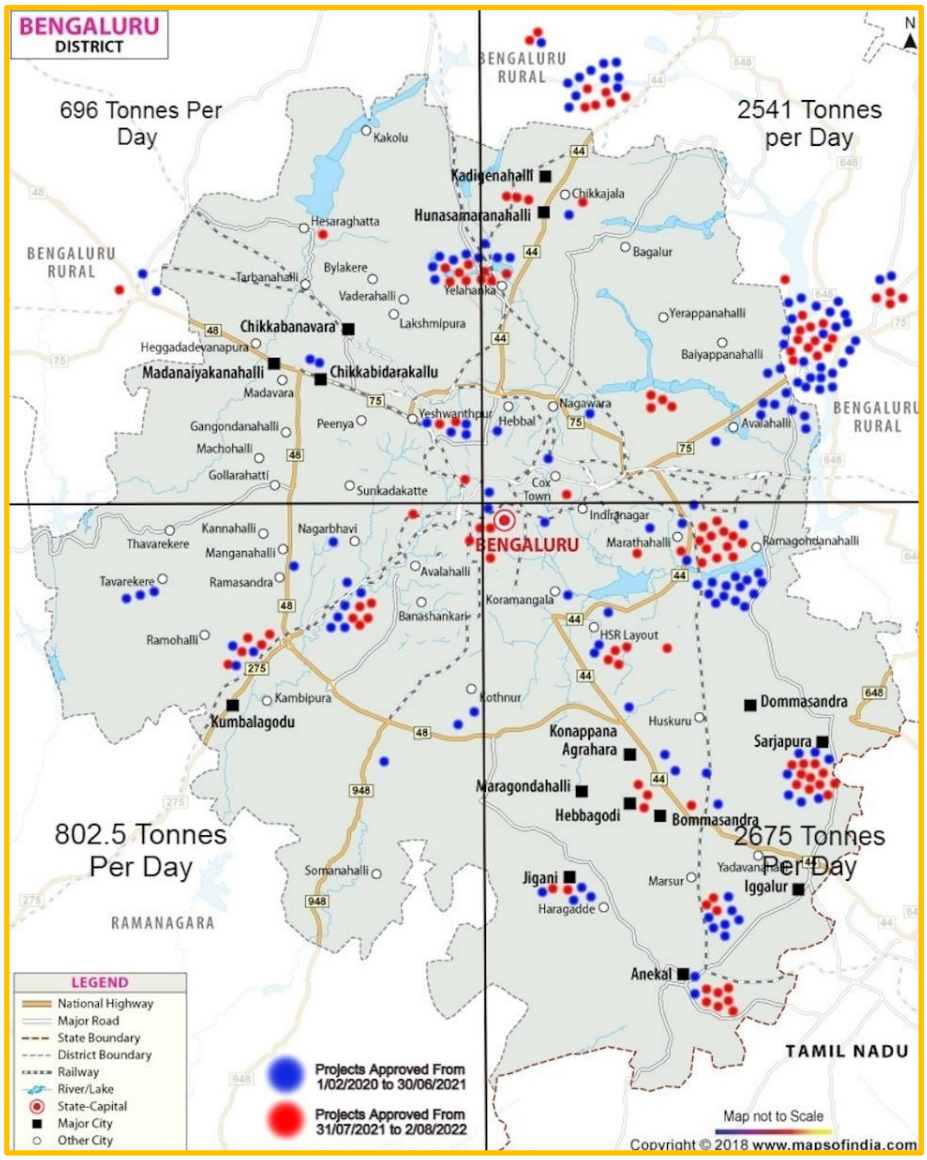


Figure 6: Total assessed C&D waste within BMA jurisdiction

From the above table it is noted as follows:

1) North and Northeastzone : 2541.00 TPD
2) East and South East zone: 2675.00 TPD
3) West and Southwest zone: 802.5. TPD
4) West and Northwestzone : 696.00 TPD.

There are two existing plants established to cater the north, Northeast with the capacity of two existing plant of 1750 TPD against the estimated C&D waste of 2541.00 TPD. Presently it is decided to establish a dedicated transport mechanism from these source generation spots to feed the C&D waste to the existing plants which are located almost 30.0 Km radius from the source generation spots to the corresponding existing plants at Chikkajala and Kannur.

The balance estimated quantity of (2675+802.5+696): 4173.50 TPD shall be proposed to establish the dedicated processing plants with dedicated transport mechanism.

Swachh Bharat Mission The Swachh Bharat Mission (under MoUD) envisages the processing of 100% solid waste generated in cities / towns by 2nd October, 2019 as a key objective, which includes C & D wastes. Ministry of Urban Development (MoUD) vide its circular dated 28th June 2012 stated all states to set up C & D waste recycling facilities in all cities with a population of over 1 million.

C & D Waste Management Rules, 2016 - Notification Unlike other rules addressing various key urban wastes such as MSW, plastic wastes, BMW, the Construction and Demolition (C & D) Waste Management Guidelines on Environmental Management of C & D Wastes (CPCB, 2017) 2 Rules, 2016 are NEW rules that were notified on 29th March 2016 by the Ministry of Environment, Forest and Climate Change (MoEF&CC).

Figure7: Bengaluru Buildings being demolished as the work on phase2 of Bengalur's Metro Project Officially

2.3 Justification for Public Need:

- The Construction and Demolition (C&D) waste is a major component of city waste

and to reduce the pressure on the exploitation of natural resources, cities need to focus on finding greener ways to produce concrete, encouraging the reuse of recycled materials to replace virgin materials. The Greenhouse Gases (GHG) mitigation increases with an improved Construction and Demolition (C&D) Waste recycling and utilization.

- The project will improve environmental conditions of the area ensuring improved public health, safety & hygiene in handling the waste. Improved health and productivity of sanitary workers.
- Savings in costs due to innovative designs, timely project implementation and higher efficiencies operations.
- Enhanced quality of services to users due to better managerial practices & efficiencies.
- Reduction in and gradual elimination of pricing constraints.
- Enabling public funds to be earmarked for other commercially non-viable but socially justifiable projects.
- Enhance the IEC activities and improving the Awareness among citizens and the community to follow C & D Waste Rules & guidelines.
- Socio-economic improvement.
- Financial Innovation and development of cost-efficient solutions.

2.4 Activities which generate C & D waste in cities/towns are mainly from:

i. Demolition of existing, old dilapidated structures;

ii. Renovation of existing buildings (residential or commercial);

iii. Construction of new buildings (residential or commercial or hotel etc.);

iv. Excavation/ reconstruction of asphalt/ concrete roads;

v. Construction of new fly-over bridges/ under bridges/ sub-ways etc.; and

vi. Renovation/ Installation of new water/ telephone/ internet/ sewer pipelines etc.

vii. Present collection and disposal system.

2.5 NGT directions

The Honourable NGT Monitoring Committee of OA 125/2017 opined to have C&D waste processing plants one at each in all 4 directions of the city. The illegal dumps which are present now can also be transported to these units. This will encourage for sustainable management and bring down the emissions levels besides its effective management to prevent dumping in the water bodies.

Bengaluru has since then developed 6 strategies to enable its shift from ‘Dumping’ to ‘Processing’ with the Guidelines of the C&D waste generation as below:

i. Investing in stream-wise processing of waste: These include aspects like the enforcement of segregation at source, investing in infrastructure and technology for processing waste, and creating an efficient collection and transportation system.
ii. A data-driven approach for estimation & planning: This includes the understanding of waste generators, data collection through field validation, and re-assessing normative standards and their application for a close estimate.
iii. Enabling market dynamics by creating new economic opportunities: Opening up the private market and empanelment of vendors for the servicing of Bulk Generators, application of the polluter-pay principle to generators and enabling Public-private partnership for setting up of processing facilities.
iv. Awareness creation & enabling behavioral change: The city has already hosted large-scale events and several small events for consensus building, awareness creation, training and skilling. In addition to this, it continues to conduct clean-up drives and post adverts and flyers, manuals, etc.
v. Use of technology for data collection & monitoring: Using technologies like GIS mapping, apps, tracking systems, biometrics etc. are being used to enable transparency, enhance efficiency, increase accountability and overall help monitor the new SWM system.
vi. Capacity building & enabling legislative reforms: This includes building institutional capacity within the government through the setting up of an SWM cell, capacity building through the inclusion of informal sector workers, exercising Extended Producer Responsibility (EPR) and enabling legislative reforms by appropriate amendments and notification.

2.6 Assessment of pollution due to existing transportation

The other major setback in continuing to operate with the existing Transport mechanism which results in huge pollution as listed below

1. Pollution caused by Trucks.
2. The disturbed flow of traffic due to truck movement.
3. Un organized transportation
4. Un organized collection

Pollution Load Caused by a 10 Ton Single axle Truck Transporting C&D Waste:

The average mileage of a 10 Ton capacity truck: 4 Kmpl (on actual grounds It shall be about 2 to 3KMPL which is much less than standards)

Average distance to be travelled by truck to transport 10 Tons of C & D waste: 60km Fuel required: 15 litres

Carbon dioxide Produced by Burning 15 Liters of Diesel: 15 x 2.62 kg =39.3 kg

According to the Project report from IISc, it shall be observed that 390 Truckloads of C&D wastes are dumped daily in the dump sites and the majority are dumped in low-lying areas and crates created by stone quarrying.At a rate of 10 Tones per Truck, to transport 1000 TPD, 100 Trips are needed, and this may result in the emission of 4 Tons of Carbon Emissions per day.

Table 3: Pollution Caused by a 10 Ton Single axle Truck while Transporting C&D Waste

Average truckloads/day in Bangalore city	390 (as per IISc Report)
Carbon Dioxide produced /truck/ load	40 kg approx/h
Carbon dioxide produced by 390 truckloads	15.6 Tons of Carbon dioxide / day
	i.e., 5694 Tons / year

By considering above and to maintain pollution and dust free city, It shall be essential to establish a dedicated collection, transportation and processing unit for C&D Waste.

2.7 Challenges In BBMP For Effective C&DWM

The civic responsibilities and infrastructure assets in Bengaluru are overseen by BBMP, Bengaluru City (BBMP) is responsible for collecting, sweeping, transporting, processing, and disposing of municipal solid waste and construction and demolition waste. However, BBMP faces many challenges in waste management, including:

- Lack of infrastructure- Bengaluru City faces significant problems due to its existing disposal practices, including high costs and open dumping.

- Lack of technical capacity- BBMP faces challenges due to its lack of technical capacity, budget, and legal and regulatory framework.

- Unscientific disposal- BBMP has not provided adequate disposal sites, scientific mechanisms, or enforcement mechanisms for C&D waste disposal.

- Construction debris- Construction debris is placed under footpaths and flyovers, and waste management in markets continues to be ignored.

- **Other challenges** to handle the CDW are like-

  i. Financial constraints
  ii. Lack of support from localities
  iii. Ineffective recycling or composting
  iv. Understanding and meeting regulations

v. Rising operational costs
vi. Transitioning to a "Circular Economy"
vii. Increasing volumes of waste
viii. Improving safety performance
ix. Lack of awareness about segregation and waste management rules
x. No strict rules that penalize non-segregation
xi. Availability of collectors who don't refuse mixed waste
xii. Low-cost recovery and under prizing
xiii. Lack of consistency and coordination between local/district municipalities

2.8 An overview of project jurisdiction:

The proposed study covers the area of Bangalore Urban District along with the BBMP Jurisdictions.

i. The Bengaluru Solid Waste Management Limited (BSWML) acting through and represented by Government of Karnataka are engaged in the Collection and Transportation of 1750TPD of Construction and Demolition (C&D) Waste at North and Northeast in BBMP jurisdiction.

ii. And as part of this endeavour, BSWML have decided to undertake Collection and Transportation of 1750TPD of Construction and Demolition (C&D) Waste and transport to the existing processing plant at Kannur and Chikkajala in Bengaluru.

2.9 Project Structuring:

DBFOT- Design Build Finance Operate Transfer with 100% bidder investment model.

Salient Features:

Concessionaire's Obligation	Concessionaire to perform Collection & Transportation of C&D waste from the source generation to transfer station and from transfer station to processing facility.
Implementing Agency	Bangalore Solid Waste Management Limited (BSWML)
Administrative Department	Urban Development Department
Land area	Land Required for transfer stations i.e. 1 TS-1500 to 1800 sqm Land parcels are identified and needs to be transferred to BSWML.
Concession Period	Concession period: 15 years from the date of COD + The Project would be implemented in accordance with the terms and conditions stated in the concession agreement to be entered into between the BSWML and the Concessionaire

	A. Mobilisation period – One month from the date of issue of work order or from the date of of handing over of the site whichever is later. B. 15 years for O&M from C&D waste
Equity IRR	14.24%
Project IRR	12.84%
Bidding Parameter	Tipping Fee for (1) Collection & transportation with an increase of WPI + 5% year on year

CHAPTER -3 :EXISTING SYSTEM OF C&D WASTE MANAGEMENT IN BENGALURU:

Bangalore is the fifth largest urban agglomeration of India and is branded as the 'Silicon Valley' of India for leading the growth of Information Technology based companies. Bruhat Bengaluru MahanagaraPalike (BBMP) is the administrative body responsible for civic and infrastructural facilities and it is run by a council. Bangalore Development Authority (BDA) is responsible for principal planning and zoning regulation of the city.

Rapid urbanisation is changing the landscape of the country. Bengaluru is one of the fastest urbanising cities in India; its population has almost doubled within a decade – from 4.3 million in 2001 to 8.4 million in 2011 (Census of India, 2011). Not only has that been accompanied by a boom in new construction, but demolition of shorter buildings to make way for taller ones is also commonplace (GIZ, 2015). The construction boom has placed enormous demands on construction materials. The case of sand is particularly instructive. It has been estimated that around 1 Million tonnes (Mt) of sand per month is being used by the construction industry in Bengaluru (Chitra and Gandhi, 2014), while the total demand for sand in Karnataka was estimated to be 26 Mt in 2014 (Shyam Sunder and Asundi, 2015). Supply shortages and price spikes for natural sand has led to a burgeoning industry for manufactured sand (m-sand) in the region; however, m-sand is being currently manufactured from natural granite (Shyam Sunder and Asundi, 2015). The enormous levels of CDW being generated, if collected and processed, could provide alternatives to depleting sand reserves and offer sustainable alternatives to the construction industry. Estimates of CDW generation in Bengaluru differ, but different studies have arrived at estimates that are in close range of each other. A study commissioned by the BBMP estimated the CDW generation in Bengaluru at 2,500 Tonnes per Day (TPD) in 2014 (Bharadwaj, 2016). The Karnataka State Council for Science and Technology (KSCST) has estimated CDW generation in Bengaluru city to be more than 2,700 TPD1 . An article in the Deccan Herald newspaper places the CDW generation in Bengaluru at 3,600 TPD, citing estimates from KSCST and the New Delhi based Centre for Science Environment (CSE) (Rajashekhara, 2016).

For this study, we conducted a supply-side analysis of CDW generation based on the stock of built-up area in 2012 [~37 Million Square Meters (MSqm)]. Assuming a 6% compounded annual growth in construction activity, we estimate CDW from demolition, repairs and new construction based on generation coefficients shown in Table 5.

Table 4: Activity-wise CDW generation coefficients

Activity	Rate of Generation (Waste/Area)
Construction	40 kg/ Sq. M
Repair	50 kg/ Sq. M
Demolition	450 kg/ Sq. M

(Source: BBMP, 2016)

Next, 5% and 10% percent of the previous year's built-up area are assumed as the repaired and demolished area (respectively) each year. This yields 2,981 TPD of CDW generation in 2012, which is expected to grow to 3,540 TPD by 2016 and 4,118 TPD by 2020.

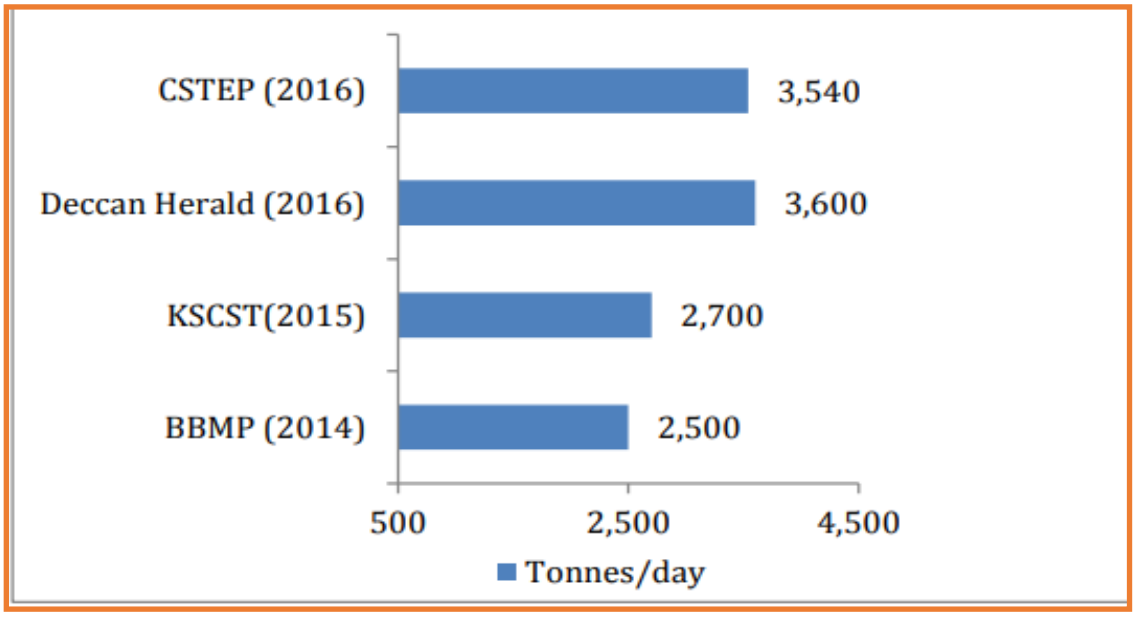


Figure8: Estimates of CDW generation in Bengaluru (with year)

3.1 Current Ecosystem of CDW

Based on the STEPS Bengaluru 2016 report the Figure -- maps out the CDW value chain starting from a construction or demolition site (CDW generator) and ending at either disposal sites (designated and undesignated) or being recycled back into the construction industry. BBMP's current CDW disposal regulations govern mainly the CDW generators

and Demolition and Transportation Contractors (DTCs); however found that much of the CDW goes unaccounted for or is dumped at illegal sites by private DTCs. To facilitate CDW recycling, BBMP will need to ensure that maximum CDW reaches the recycling units, implying some mechanism for DTCs to either transport it directly from the generation site to recycling plants or from the disposal sites. The DTCs could also be provisioned to offer segregated CDW at additional charges to the user. BBMP has not been able to fully enforce the CDW norms in their existing shape. Therefore, to facilitate a functioning CDW supply chain, it will have to significantly step-up enforcement. If successful in doing so, BBMP can effectively free itself up from expending significant resources on CDW disposal. The products from CDW processing in Bengaluru must have a market to facilitate their diffusion and uptake as building materials. Given the scale of expected construction activity in Bengaluru over the next 5-10 years, the demand for building materials already exists locally. To compete against conventionally produced building materials, CDW-based products will require not only certification from appropriate testing and certifying authorities but also to be demonstrated as cheaper substitutes without compromising on strength and other important aspects. The two functions can also be performed within the city boundaries, for example, Bengaluru University and Indian Institute of Science (IISc) contain facilities to test and certify products from CDW; institutions such as CREDAI, Karnataka Public Works Department (KPWD), Karnataka Housing Board (KHB), Bengaluru Development Authority (BDA), etc. can significantly help promote CDW-based building materials by using these for the numerous non-structural applications where they can easily replace conventional products. This can be done via institutional purchase mandates, white-papers, awareness campaigns, etc.

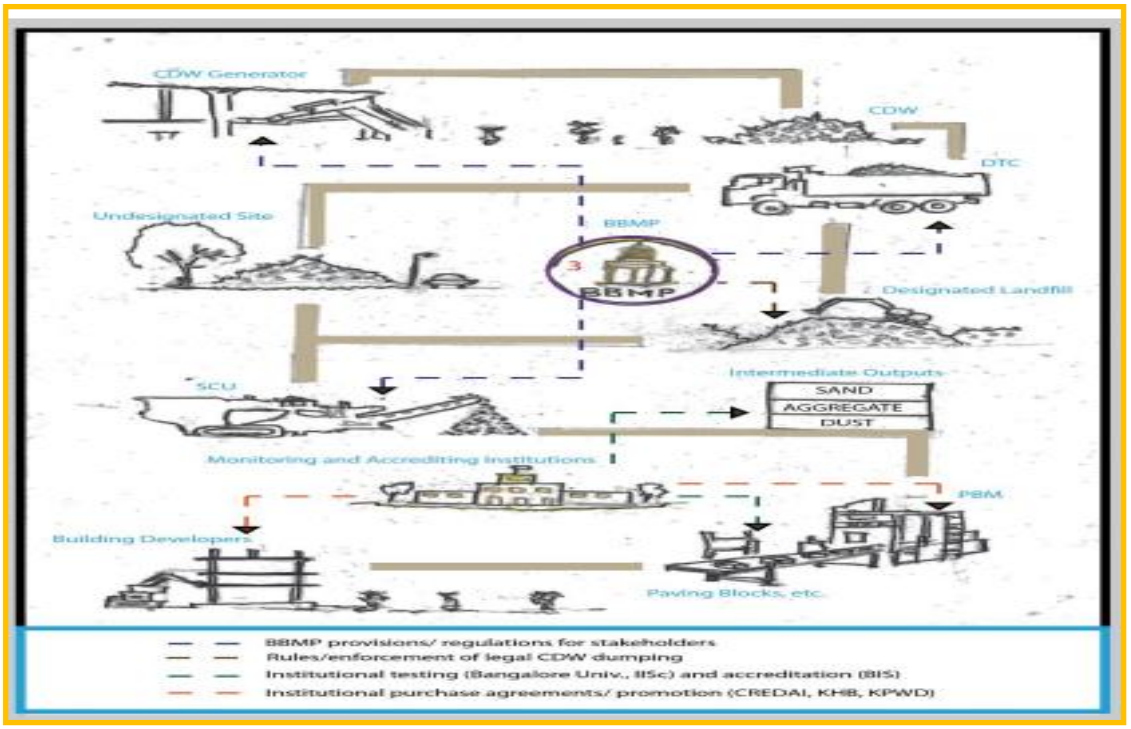


Figure9:CDW disposal & processing ecosystem in Bengaluru

From Figure 9: Depicts the existing collection, transportation and disposal schematic for Bengaluru's CDW. New construction,

remodelling/additional work on existing buildings, and demolition and rebuilding, pavement repairs and other public works all generate CDW.

3.2 Estimation of CDW from Construction Projects in Bengaluru

The quantity of CDW generated can be estimated from the total built-up area of the construction projects in a city/region under examination. Databases were created that could estimate an approximate quantity of debris generated by each project upon input of its total built-up area. Details of all newly built or approved large residential construction projects in Bengaluru City were obtained, and the amount of C&D generated by each project was calculated from the Guidelines for Construction and Demolition Waste Management of BBMP .

Urban waste management Safe and cost-effective management of C&D waste is a significant environmental challenge for modern society. Rapid urbanization is changing the nature of C&D waste management from a low-priority, localized issue to a pervasive social and environmental problem with risks to public health and the environment. Inadequately managed waste disposal has the potential to affect the health and environment. Management wastes need to incorporate the principles of waste minimization and recycling and work towards an integrated processing & disposal facility such that it is both effective & sustainable. In most urban wastes ex. Municipal Solid Waste (MSW), Biomedical Waste (BMW), or Construction & Demolition (C & D) Wastes - management of solid waste is required at all stages from waste generation to the final disposal.

3.3 Methodology

This report studies the CDW management policies established by MOHUA & MOEF&CC and NITI AAYOG and the current status in the MBA limits through a literature review and interviews with key stakeholders, and a broad study on KSPCB report of C&D waste assessment and the need for significant improvement in CDW management and recycling; and analyzes the obstacles to the application of recycled building materials and the feasibility of market-based solutions for incentivizing CDW recycling. A Road map shall be established for assessing the rate for the Collection & transportation cost and processing cost shall be established after taking the circular economy policy into consideration.

3.4 Waste Types and Quantities

This study focuses on the types of CDW which are the responsibility of the Ministry of Housing, Urban Development Authority(MOHUA), and therefore does not include wastes from the road, hydraulic and hydropower structures, railways, and tunnels.

Themaintypesof CDWare:

- Wastefromexcavation from Non-Bulk generators
- Wastefromdemolitionofoldbuildings
- Wastefrom constructionsites,and
- Wastefrombuildingfit-outanddecoration.

The types of CDW generated depend on construction methods and the types of buildings being demolished.Modernbuildings are primarily constructed from reinforced concrete, whereas buildings currently being demolished in BMA limits,datingfromthe 1960sto1990s,includea large proportionof Sheet roofing structures, bricks, and stone buildings.

Among the above CDW components, a mature recycling system has been developed for asphalt blocks, and there is alsoactive recycling and reuse of waste metal, plastics, wood and glass and these recycling metals are out of this study.The remaining large amount of surplus spoil, scrapbricks and tiles, waste mortar and concrete blocks have become the current focus of CDW management and recycling.From environmental protection and disposal safety perspectives,management of surplus spoil is one of the key issues,butthere isno maturerecyclingtechnologyforthismaterial.

MOHUA issued its guidelines in June 2021 about the official statistics of CDW production at the national level, according to several survey results, CDWproduction shows an upward trend each year, with the annual CDW production currently being over xxxx billion tons. Arecent study[1]estimatedthatCDWproduction willreachoverxxx billiontonsperyearin2031.

3.5Laws and Regulations

Laws

The government of India by NITI AAYOG & MOEF&CC and MOHUA has formulated laws for CDW management and solid waste management.

- EnvironmentalProtectionLaw
- CleanerProductionPromotionLaw
- SolidWastePollutionPreventionLaw
- CircularEconomyPromotionLaw
- BuildingLaw

However, the provisions of these laws are expressions of principle, low in operability, and therefore they do not adequatelyprovide guidance or deter illegal behaviour: they can only provide a basis for policy formulation. It is recommendedthat there should be a series of supporting administrative laws, regulations and systems that can truly provide guidance for CDWmanagementandrecycling.CDWareregionalmaterials,andthereforeprovincial,municipal,andcountygovernments should also be able to formulate CDW management methods.

Standards

There are CDW recycling-related standards, including those already issued and those under formulation, and manystandardsthat arealreadyissued.

3.6 C&DW Management and Recycling Authorities

Although all departments performed their duties still there is need to improvise the laws.MOHUAisin charge of the management of source andfinal useof CDW;whilst U L B s areresponsiblefor the managementofCDWrecyclingcompanies.

CDW recycling enterprises are regarded as “common enterprises” when the State Commission Office of Public SectorReform defined the responsibilities. According to the *“Notice on urban domestic waste treatment charging system andpromoting waste treatment industrialization”* (NDRC [2002]872), urban solid waste explicitly included CDW and spoil,therefore, construction waste recycling facilities should be regarded as“public utilities”. Referring to solid wastemanagement, urban infrastructure shall be managed by the centralized construction department, which is conducive to theimplementationandenforcement ofpolicies.

CHAPTER-4 COLLECTION & TRANSPORTATIONOF C&D WASTE

As the urban population is growing rapidly hence the housing requirement is substantially increased. Bengaluru Solid Waste Management Limited (BSWML) has been given the task to handle the C&D waste scientifically in its disposal scheme. Hence BSWML has taken an initiative to dispose of the Construction & Demolition Waste in a scientific manner by adopting the Collection & Transportation of the same at designated locations based on the availability of the quantity being assessed through various studies being conducted either by BBMP or by KSPCB.

Guiding Principles For Management Of C&D Waste

The State of Karnataka will focus on the 3R principle (i.e., reduce, reuse and recycle) for the management of C&D Waste generated within the state. In addition, the state works towards financial viability of C&D Waste processing and increasing the awareness levels and capacities of different stakeholders such as government officials, construction/real estate industry, public works department etc. with regard to C&D Waste management. This is elaborated below:

(i) Source reduction measures such as preservation of old buildings, optimisation of space in new buildings, designing building and infrastructure which reduce use of construction and material on site

(ii) Using deconstruction3 prior to demolition to salvage reusable materials from the construction site where the items which are usable directly are screened out from the debris and put into the intended use without further processing. These could include useful products like doors and windows, bricks, structural steel that can be taken out with little extra efforts and put into reuse without much processing.

(iii) Once the C&D Waste has been segregated and reusable items are taken out, the leftover waste should be recycled to the extent possible. This is also vital for ensuring that minimum amount of waste is sent to landfills.

(iv) Many new recycled products are now available like recycled aggregated, fly ash bricks, pavement bricks/paver blocks, salvaged usable materials from demolition sites for reuse. To support recovery practices, market space to receive and sell salvaged materials from demolition, recycled products will be developed in the state of Karnataka.

WASTE GENERATOR AND DIFFERENT TYPES OF WASTE GENERATORS

1. **“Waste Generator”** is defined by the C&D Rules as any person or association of persons or institutions, residential and commercial establishments including Indian railways, airport, port and harbour and defence establishments who undertakes construction or demolition of any civil structure which generate C&D Waste.

For the purpose of this Karnataka C&D Policy &Strategy, "waste generators" shall be divided into four types:

(i) **Micro generators:** The small generators who occasionally generate C&D Waste less than 50 kgs from minor house repairs, broken ceramic sanitary ware like tiles, bathtubs, commodes, washbasins etc.

(ii) **Small Generators:** Those that generate C&D waste during building renovation, remodeling or petty construction, repair or maintenance works etc. where the total amount of C&D Waste generated in the entire project is more than 50 kgs and less than 20 MT per day. It is clarified that if the project generates (a) an aggregate of 300 MT of C&D Waste per month **and**/or (b) pertains to demolition work covering an area of 600 square metres; and/or (c) construction or building repair work covering an area of 6000 square metres4, the waste generator will not be considered as a "Small Generator" and will have to comply with the requirements of a "Bulk waste generator".

(iii) **Bulk waste** generators**:** Waste generators who generate more than (a) 20 MT or more in **one** day or 300 MT per project in a month as identified separately in the C&D Rules and/or (b) demolition work covering an area of 600 square metres; and/or (c) construction or building repair work covering an area of 6000 square metres.

This is calculated using the TIFAC thumb rule on the amount of C&D Waste generated per square metre.

BSWML want to strengthen the CDW management by the following steps:

1. A comprehensive plan (C/P) shall be prepared in consultation with an agency who is going to be appointed by the BSWML for the execution of the Collection and transportation of the C&D waste to feed two existing plants for the capacity of 1000 TPD & 750 TPD should prepare comprehensive C&D Waste Management Plan, covering storage, collection and transportation to up to the existing plants and further disposal of the inert to the designated landfills.
2. The C/P shall indicate the collection, storage, containment, and transportation of all claimed & unclaimed C&D waste to the facility for its further processing and disposal.
3. It will be indicated in the contractor scope that, the contractor will be responsible for lifting unclaimed waste from areas, as directed by BSWML officials, which otherwise cause a nuisance to vehicular traffic, mainly on both sides of the roads and at junction points. The heaps of C&D waste dumped by the roadside/isolated are to be cleared by the contractor.
4. Set up a common call centre facility in consultation with the Contractor selected for Collection, Transportation, Processing and GPS-based, Android& iOS based interactive Mobile Application for easy access to the C&D waste facility for the user (8 am to 8 pm, all 365 days) for registering a request for collection from BSWML and

private parties. The contractor should attend all the sites within 48 hours.

5. It will be indicated in the bid that the responsibility of the contractor includes providing an adequate number and types of vehicles for collection and transportation. These vehicles shall be in compliance with RTO rules/ regulations and all other applicable rules & regulations/ notifications by the competent Authority.
6. Install GPS in all vehicles at its own cost and provide MIS data to BSWML on a monthly basis and whenever required by BSWML intermittently.
7. Provide all the MIS Data of the project to BSWML along with the monthly bill as approved by BSWML at the time of execution of the project.
8. It shall be indicated in the bid that, for less than 1 MT of C&D Waste generator i.e. Small Generator, the Contractor has to provide door-to-door service for collection and transportation for less than 1 MT C&D Waste after confirmation of payment receipt paid to BSWML.
9. For generators of C&D waste equal to or more than 1 MT & less than 20 MT i.e. Medium Generators, Concessionaire shall provide a door-to-door collection facility. Such generators have to book their request, make payments & store C&D waste within their premises ready for lifting.
10. For BSWML's other civil works/bulk generators having quantity equal to or more than 20 MT per day or 300 MT per project per month, there will be two cases-
    (i) In case the bulk generator uses BSWML's Collection and Transportation services then the Contractor for this project will make arrangements for the Collection, Transportation & Disposal of C&D waste from bulk generators. The bulk generator will make payment to the contractor directly as per the rates approved by BSWML.
    (ii) In case the bulk generator transports the waste directly to the processing plants site on his own cost then the Bulk generator shall seek prior approvals for the accepted transport mechanism being accepted by BSWML and bulk generator has to pay the fee towards the processing fee to the processing plant agency as per the rates approved by BSWML.
    (iii)If there is a difference between the invoice generated by the waste generator and actual C&D Waste found on the site, Contractor shall inform BSWML and only collect waste corresponding to the invoice quantity, in case the generator shows subsequent confirmation for the remaining quantity then the contractor shall collect the C&D Waste. All payments shall be linked to the online portal on at least a weekly basis.
11. For unclaimed debris in any ward, the contractor in the presence of BSWML's staff will take a minimum of Two (2) Geo-Tagged photographs of the C&D Waste Pile from different angles, which will mention its date, time and location before and after collecting the waste. Two (2) Geo-Tagged photographs each, before and after collecting the C&D Waste, shall be uploaded on the mobile application/ system and shall be submitted along with the monthly bill to BSWML for the unclaimed C&D waste. Payment of unclaimed debris shall be made by BSWML as per the record. The contractor has to install Load Cells/On board weighing mechanisms on all the

vehicles deployed for the project. Specific weight at every spot of claimed and unclaimed C & D Waste shall be recorded, and the contractor shall make the needful arrangement.

12. Facility for "on-demand/ on-call pickup" of C&D from claimed C&D wastegenerators need to be created by the contractor. The contractor has to liftunclaimedwasteandbulkgeneratorscandeliverC&Dwasteattheprocessing plant after specific approval from BSWML in cases when 750 TPD/ 1000 TPDcannot be met through Debris On-call and unclaimed debris for a respectiveslice.
13. It shall be indicated in the bid that, the Contractor has to market and promote its services for the lifting of claimed C&Dwaste.
14. Give methodology of collection & transportation of C & D waste which shouldinclude collection from the zone, ward, complain-based collection, and request-basedcollection systemutilisingthe vehicles asmentioned.
15. Proper transportation permits should be obtained and the agency shall havethenecessarypermits
16. It shall be indicated in the bid that; the Bidder has to dispose of the inserts at a suitable location and appropriatemanner as per the methodology and rules of the receiving area and withapprovalsfrom the competentauthority.

1) It shall be indicated in the bid that, the bidder has to provide Uniforms, fluorescent Jackets and other Safety GearasperC&DWaste Management Rules 2016toitsoperatingstaff.

17. It shall be indicated in the bid that; TheBidderhastoprovide an adequatenumberofSupervisorystaffwith the conveyance for mobility and communication tools for effective coordination ofthe system.
18. It shall be indicated in the bid that; The Bidder has to specifically procure the assets for the C&D waste purposeand all the assets would be painted with specific colour codes and numbers andnames written on them as per direction from BSWML officials. After the complianceonlythevehicleswouldbeallowed tooperate.
19. Theoperationinvolvesvariousmovementsofvehiclesformaintenance,transportation of vehicles from the collection point to the Plant site, processing of theC&D Waste and produces recycled materials and movement of vehicles from the plantsite to a disposal site.
20. It shall be indicated in the bid document that, the successful bidder has to provide the registration number of their vehicles toBSWML prior to the start of the operation. BSWML may direct the Contractor to getaudited any of the software/ GPS system/ VTMS system used for the projectfrom the authorized agencies acceptable to BSWML at any time during thecontractperiod.
21. It shall be indicated in the bid document that, thesuccessfulbidderhastoestablish a controlroom, and workshopontheprocessingplantsiteitself.
22. It shall be indicated in the bid document that, thecontractorshallundertakeamassawarenessprogramme,intheirrespectiveslice,soastoe nsurethatC&Dwastebeing generatedinitscontractareaisnotbeing litteredalong theroadsideor disposed ofat the existingMSWdumpsite(s).
23. It shall be indicated in the bid document that,

thecontractorshallcarryoutawareness,capacitybuildingandICEactivities.

24. It shall be indicated in the bid document that, the contractor shall create a sustained system of information, education andcommunication for construction and demolition waste through collaborationswith expert institutions and civil societies and also disseminate through theirown website
25. It shall be indicated in the bid document that; the contractor should keep a track of the generation of construction anddemolitionwastewithintheBSWMLlimitsandestablishadatabaseandupdateona regularbasisin ordertooptimize itsprocessingfacility.
26. It shall be indicated in the bid document that; the contractor shall coordinate with the BSWML periodically to understand theC&D wastegeneration.
27. It shall be indicated in the bid document that, thecontractorwillinvolvecommunityparticipationanddiscusswiththecitizen community in order to ensure a free flow of information on wastegeneratedbyindividualssoastooptimizethecollection,transportation,Processingan dManagementFacility.
28. It shall be indicated in the bid document that, Thesuccessfulbiddershallcompulsorilyinstall a VehicleTrackingManagementSystem(VTMS)oneachvehicleusedfor the collection&transportation of C&D waste and disposal of post-processing rejects, with thenecessary web-based software, accessible from the web, personal computer/laptops, network links, antivirus, printer, GPS / Sim Card / Dongle and shallprovide necessary training to the Municipal Staff and connect the system withMunicipal server through IT department of BSWML with loading/unloadingswitchforvehicles transportingC&Dwaste/post-processing rejects at theirowncost.Pleasenotethatforpaymentof the tippingfee, a VTMSrecordismandatory.
29. It shall be indicated in the bid document that, thesuccessfulbidder is toprovideVehicleTracking ManagementSystem(VTMS)includingcompleteclientsiteconnectivityatdifferentlocati ons,Weighbridge etc. The system must be a web-based application including GPS-based live tracking with GIS mapping and integrated maps. The successfulbidder must provide all necessary hardware (e.g., Computers, GPS etc.) andnecessary connectivity with the BSWML server. The successful bidder to comply with serverrequirements ofBSWML.
30. It shall be indicated in the bid document that, the successful bidder shall have to provide a separate set of vehicles withVTMS installedand connectedto the BSWML Server forthisproject.
31. It shall be indicated in the bid document that a GPS System shall be installed/fixed/provided in each vehicle deployedunder this project for the collection & transportation of C&D waste and shall be inworkingconditionsalways.FeedfromtheseGPSwillbeintegratedwithBSWMLwebsites .
32. It shall be indicated in the bid document that; the successful bidder shall provide the

real-time feed/monitoring of the GPSSystem through Web-basedTechnologyand integrate it to the BSWMLportal.

33. It shall be indicated in the bid document that Before the commencement of services under this project, the contractor shallsubmit a detailed work plan for the collection, and transportation ofC & D waste and get it approved from BSWML. This plan may be amended infuture as per the project requirement; however, such amendment will requirepriorapproval ofBSWML.
34. It shall be indicated in the bid document that the Collectionof Municipal SolidWasteandBio-medicalWasteisnotwithinthepurview ofthisProject andIt shall besupposedto behandledas per SWM Rules 2016 and Biomedical Waste – Management & Handling Rules. TheSuccessfulBidderisthereforeundernoobligationtocollect,transport,treat,or dispose of Municipal Solid Waste and Bio-medical waste. However, in theevent of finding Municipal Solid Waste and or Bio-medical waste disposed ofunscientifically alongside C&D Waste or mixed with C&D Waste, in the wardscoveredinComplete Sanitationor Partial Sanitation,theContractor shallnotify the same to BSWML. The Contractor shall not take such waste to theC&D Waste Processing Facility as it may contaminate other product derivedfromtheWaste.
35. Mobilization period - It shall be indicated in the bid document that, the contractor shall complete all the activities such as obtaining all clearances required for the project including clearances required for mobilization/procurement of necessary equipment, vehicles, types of machinery & resources required for Collection, Transportation of Construction and Demolition (C&D) Waste from BSWML area and commission the contractual work within 06 months of issuance of LOA.
    - Service level benchmarking
    - Machinery & manpower
    - Printmedia
    - Electronic media
    - ScheduleofPenalties
    - Internal Performance Monitoring
    - Contract Period
    - Nature & type of contract:
    - Signing of Agreement
    - Permits & Clearances

4.1 CDW Disposal in Bengaluru

The BBMP has developed guidelines for CDW management and are in the process of developing a comprehensive management plan. Eight sites have been designated around the city (many of them former stone quarries) for CDW disposal (BBMP, 2016). Further, 3 of these sites – Mallasandra, Anjanapura, and Kannur – have been shortlisted for potential future CDW reprocessing facilities. However, at present, only three out of the eight BBMP designated sites are active. Based on our analysis, it is estimated that 240

TPD of CDW are dumped at the BBMP designated sites (Table 2). Even by most conservative generation estimates, this is only about 10% of total CDW generation in Bengaluru.

Debris deposited at Bellary Road

Table 5: CDW at BBMP designated sites

BBMP Designated Site	Trucks/Day	TPD
Mallasandra	01	10
Anjanapura	08	80
Srinivasapura and Kogilu	15	150

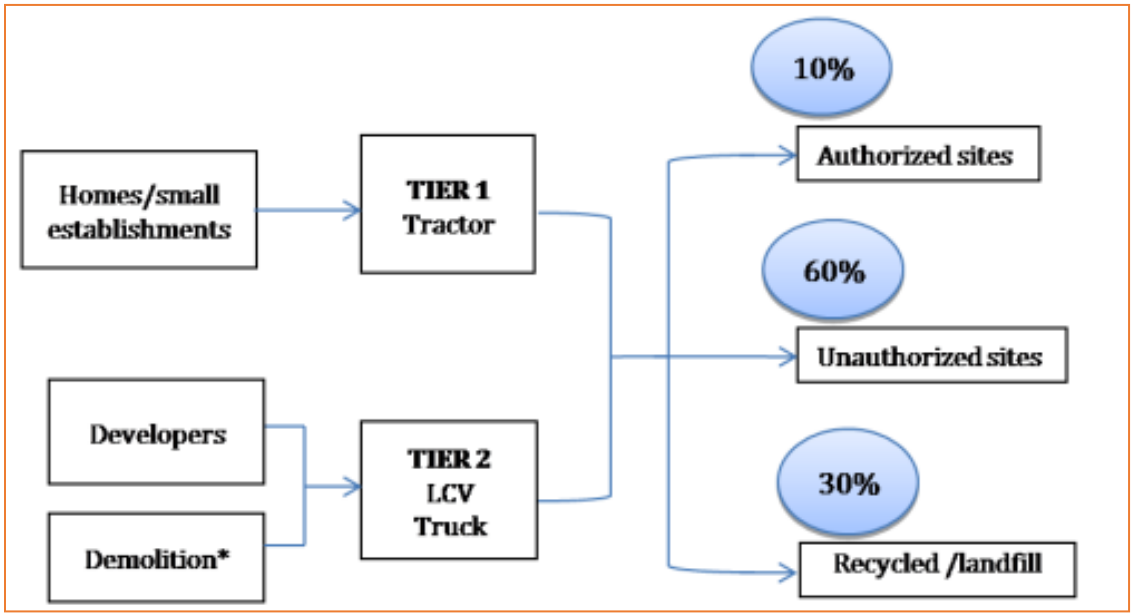


Figure10: CDW collection, transportation and disposal schematic for Bengaluru (*refers to the demolition of buildings, road repair works and pavement works)

From the STEPS report survey, we estimate that approximately 10% of the CDW enters BBMP dumping sites. Based on interactions with the Confederation of Real Estate Developers Association of India (CREDAI) and DTCs, we estimate that roughly 30% of the CDW debris is being used at various sites for levelling low-lying areas and land reclamation for future construction.

Figure11: CDW at Srinivasapura and Kogilu site

The remaining CDW is unaccounted for as it is dumped illegally in or around roads and highways, wastelands, old lakes, and valleys. The BBMP guidelines clearly state that builders need to show the waste disposal plan before remodelling or demolishing a

building. No waste can be disposed of in unauthorised areas other 9 than BBMP designated CDW disposal sites. The BBMP-authorised DTCs are expected to pick up the waste from small establishments or generators within 48 hours of receiving a notice from BBMP (BBMP, 2016). However, the enforcement of these rules has been inadequate. Most of the operating DTCs are private, that is, they have not been authorised by the BBMP for such activities. As a result, their activities are not under regulatory supervision. Smaller builders in the unorganised industry also contribute to the problem of unaccounted waste (Bharadwaj, 2016).

4.2 Transportationof C&D Waste

Proposed locations for transfer stations and distance for existing 1750 TPD Processing Plant at Kannur & Chikkajala

Maps of Transfer Station and Processing Facility

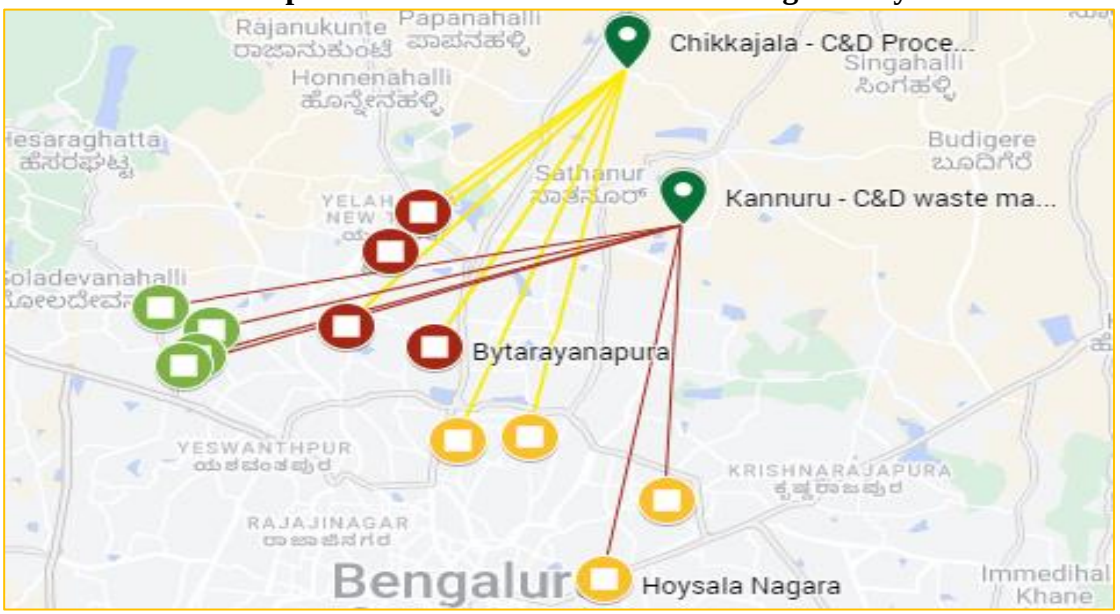
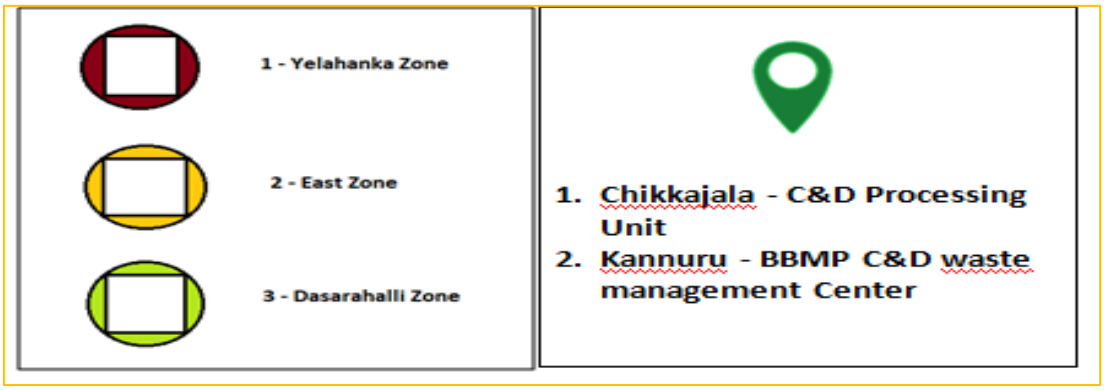
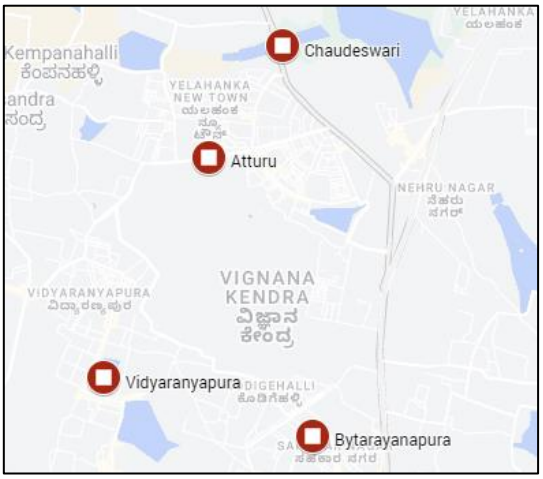


Figure12 - The Map below depicts the project area of Bangalore Urban District and BBMP area

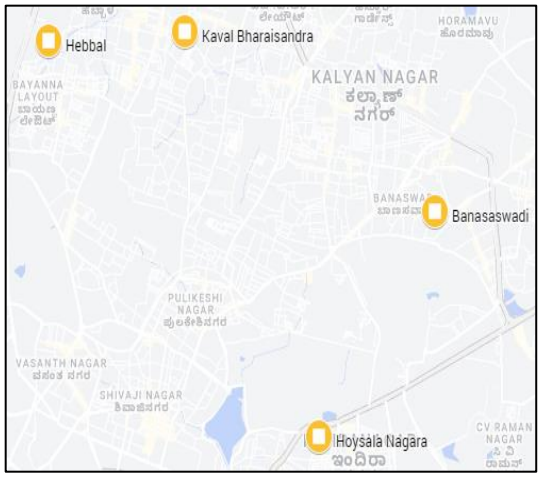

1 - Yelahanka Zone
2 - East Zone
3 - Dasarahalli Zone
1. Chikkajala - C&D Processing Unit
2. Kannuru - BBMP C&D waste management Center

ZONE 1 - YELAHANKA ZONE



1. Yelahanka Zone			
Transfer Station	**Ward No**	**Ward Names**	**Area in Sq.m**
1	**2**	**Chaudeswari**	**1835 sqm**
2	**3**	**Atturu**	**3627 sqm**
3	**7**	**Bytarayanapura**	**1808 sqm**
4	**9**	**Vidyaranyapura**	**2150 sqm**

ZONE 2 - EAST ZONE

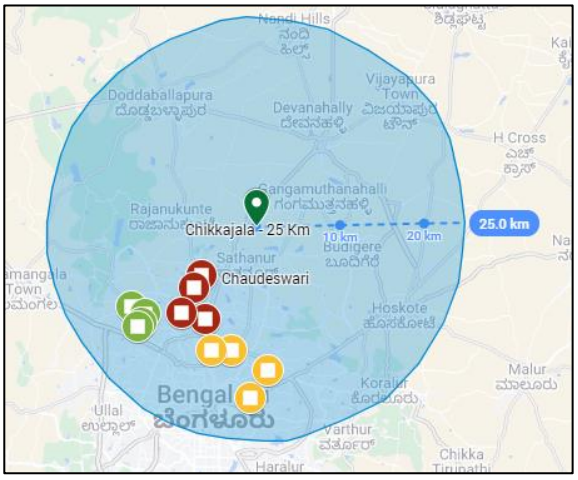


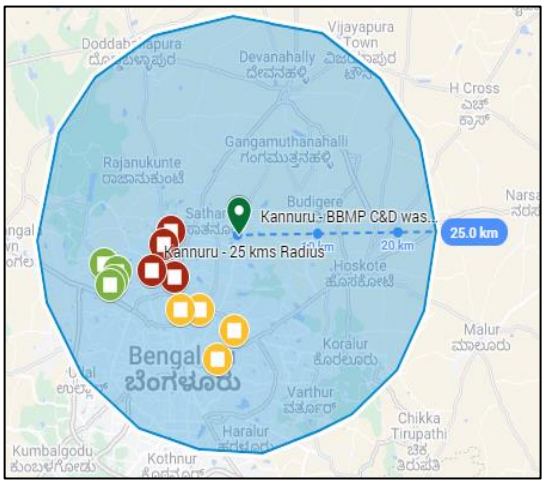
2. East Zone			
Transfer Station	**Ward No**	**Ward Names**	**Area in Sq.m**
5	**32**	**Kaval Bharaisandra**	**2560 sqm**
6	**80**	**Hoysala Nagara**	**2566 sqm**
7	**27**	**Banasaswadi**	**2242 sqm**
8	**21**	**Hebbal**	**1071 sqm**

ZONE 3 - DASARAHALLI ZONE

3.Dasarahalli Zone			
Transfer Station	**Ward No**	**Ward Names**	**Area in Sq.m**
9	**12**	**Shettahalli -1**	**2592.42 sqm**
10	**12**	**Shettahalli - 2**	**2124.6 sqm**
11	**13**	**Mallasandra - 1**	**9607 sqm**
12	**13**	**Mallasandra - 2**	**1827 sqm**

25 km Radius coverage transportation of C&D Waste to Processing Plants

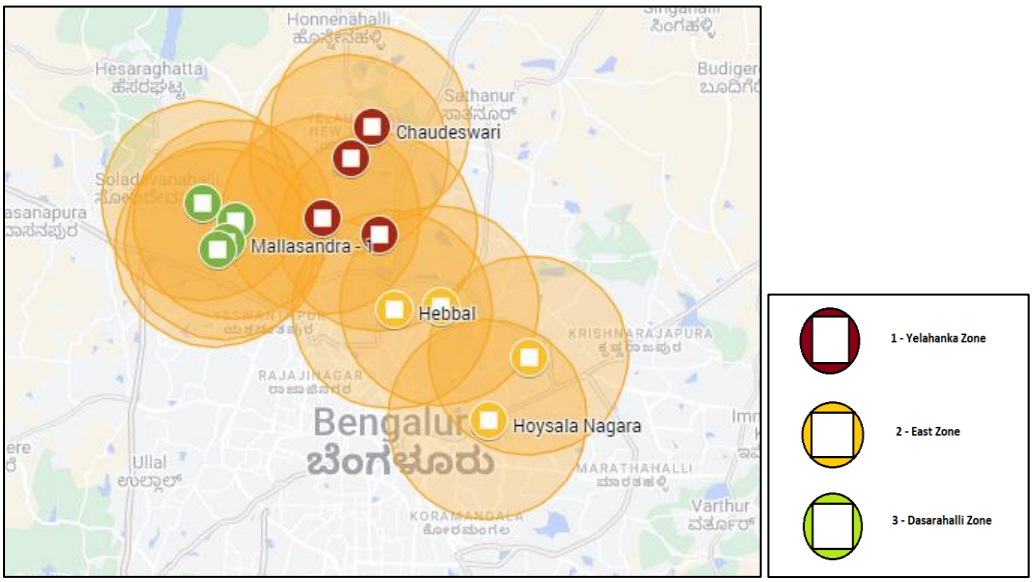




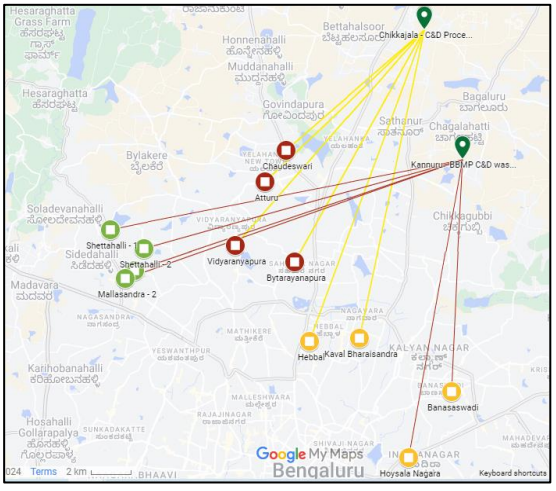
Chikkajala - C&D Processing Unit

Kannuru - BBMP C&D waste management Center

5 km Radius coverage transportation of C&D Waste from Source to the Transfer Station



Distance (Diagonal Radius) map from Processing Facility to Transfer Station

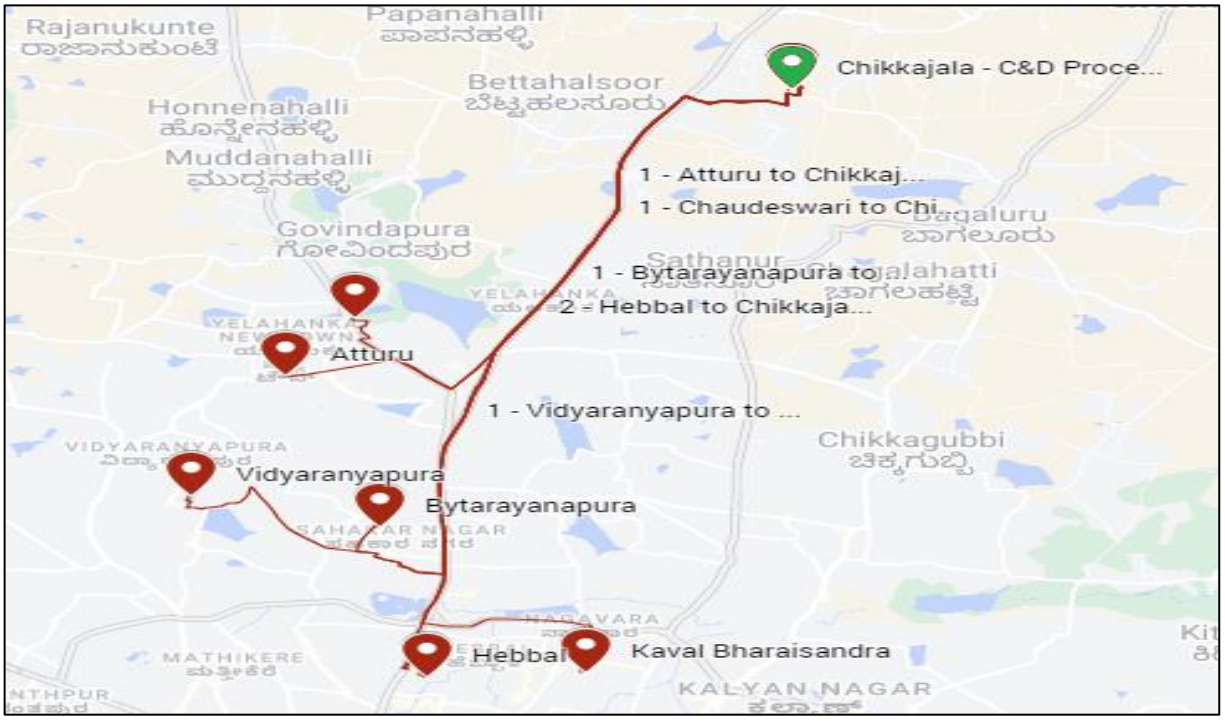


Proposed locations for transfer stations and distance for existing 1750 TPD Processing Plant at Kannur& Chikkajala						
1.Yelahanka Zone						
Transfer Station	**Ward No**	**Ward Names**	**Area in Sq.m**	**Reserve for**	**Distance (Km) (as per Radius)**	**C& D Waste Processing Facility**
1	2	Chaudeswari	1835 sqm	For Public Use	8.76	Chikkajala

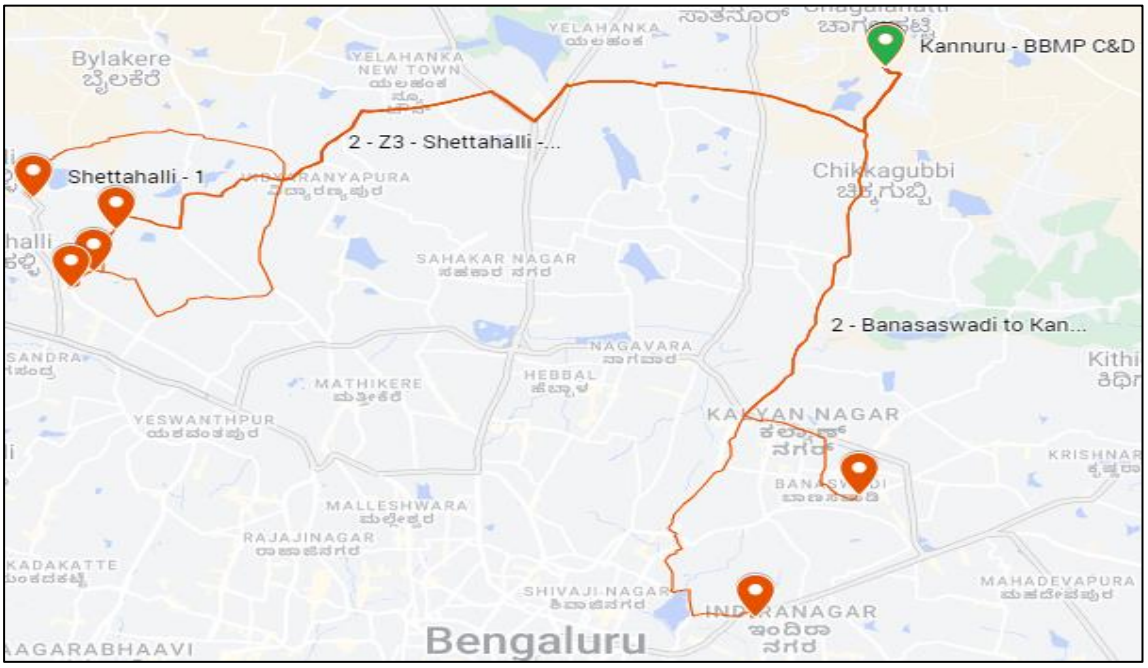
2	3	Atturu	3627 sqm	Garden	10.4	Chikkajala
3	7	Bytarayanapura	1808 sqm	For Public Use	12.6	Chikkajala
4	9	Vidyaranyapura	2150 sqm	For Public Use	13.6	Chikkajala
2.East Zone						
5	32	Kaval Bharaisandra	2560 sqm	For Public Use	14.9	Chikkajala
6	80	Hoysala Nagara	2566 sqm	For Public Use	14.5	Kannuru
7	27	Banasaswadi	2242 sqm	For Public Use	11	Kannuru
8	21	Hebbal	1071 sqm	For Public Use	15.6	Chikkajala
3.Dasarahalli Zone						
9	12	Shettahalli	2592.42 sqm	For Public Use	17.1	Kannuru
10	12	Shettahalli	2124.6 sqm	For Public Use	15.8	Kannuru
11	13	Mallasandra	9607 sqm	For Public Use	16.5	Kannuru
12	13	Mallasandra	1827 sqm	For Public Use	17.1	Kannuru

Distance (Route) map from Processing Facility to Transfer Station

Chikkajala - C&D Processing Unit



Kannuru - BBMP C&D waste management Center



Transfer Station	Ward No	Ward Names	Area in Sq.m	Reserve for	Distance (Km) (as per Google Route map)	C& D Waste Processing Facility
1.Yelahanka Zone						
1	2	Chaudeswari	1835 sqm	For Public Use	13.8	Chikkajala
2	3	Atturu	3627 sqm	Garden	13.8	Chikkajala
3	7	Bytarayanapura	1808 sqm	For Public Use	17.9	Chikkajala
4	9	Vidyaranyapura	2150 sqm	For Public Use	21.1	Chikkajala
2.East Zone						
5	32	Kaval Bharaisandra	2560 sqm	For Public Use	20.8	Chikkajala
6	80	Hoysala Nagara	2566 sqm	For Public Use	18.2	Kannuru
7	27	Banasaswadi	2242 sqm	For Public Use	14.2	Kannuru
8	21	Hebbal	1071 sqm	For Public Use	18.6	Chikkajala
3.Dasarahalli Zone						

9	12	Shettahalli	2592.42 sqm	For Public Use	22.6	Kannuru
10	12	Shettahalli	2124.6 sqm	For Public Use	20.5	Kannuru
11	13	Mallasandra	9607 sqm	For Public Use	23.2	Kannuru
12	13	Mallasandra	1827 sqm	For Public Use	22.6	Kannuru

CONCLUSION ON DISTANCE

Description	Distance (Km)
Overall Average Km coverage of all processing facility to the transfer station as per the Diagonal Radius	14
Overall Average Km coverage of all processing facility to the transfer station as per the identified Route Map	18.94

In comparison to the above two conditions the overall average difference between processing facility to transfer station on basis of route map and diagonal radius varies between 5 km

CHAPTER-5: FINANCIAL & TECHNICAL ASSESSMENT: THE BIDDER HAS TO ASSESS THE FINANCIAL AND TECHNICAL REQUIREMENTS AS PER THE PROJECT REQUIREMENTS GIVEN IN THE PROJECT BRIEF

CHAPTER- 6 :SUMMARY AND CONCLUSION

6.1SUMMARY:

The Master plan for Bengaluru anticipates a population of over 2.0 Crore by 2031. While this may be very high, it would be reasonable to assume a steady increase of population in range of 1.80 Crore. The city has highest number of INR 1.0 Million per captia earners in the country and the economic outlook looks positive. The institutional base in the city complements the growth of services industry, high technology and start up. The city attracts huge FDI share of the country.

The city has about 1.3 Crore square feet of quality space in the commercial sector of real estate, with lowest vacancy levels in the country. The developments are predominantly in the east and ORR. The release of space in the centre of city and the suburban areas are getting addreesing the need by adding additional constructional areas on a rapid manner to meet the demand.

Residential sector has been growing at steady pace – the overall inventory available in the city is moderate and the demand for affordable housing is significant. Bannerghatta road, Hosur Road, Eastern Parts followed by the North side towards the Airport is picking up

By considering the demand and supply of real estate requirement, the city expected to increase the requirement of construction activities thus it is expected to drastically increase generation of the volume of the construction and demolition waste.

The Construction and Demolition (C&D) waste is a major component of city waste and to reduce the pressure on the exploitation of natural resources, cities need to focus on finding greener ways to produce concrete, encouraging the reuse of recycled materials to replace virgin materials. The Greenhouse Gases (GHG) mitigation increases with an improved Construction and Demolition (C&D) Waste recycling and utilization.

This report is attempts to provide the insight understanding and approach to create a comprehensive assessment of the rate to be collected as user fees from the source generator to pay towards collection, transfer and transportation to processing plant of C&D waste.

1. Effective implementation of segregation of waste at source by all waste generators, and at all levels and scales and an integrated Transportation mechanism shall be established

2. The C&DW shall be linked to the 4R approach (Reduce, Reuse, Recycle and Recover) and principles of circular economy which also emphasizes the importance of waste reduction, reuse, recovery and recycling over other forms of waste processing or management.

3. Open dumping of C&Dwaste is prevented by emphasizing strict rules.

4. The State Government and BBMP will ensure the health, safety and dignity of every person and stakeholder involved in handling C&D waste in all respects.

5. BBMP shall emphasize not only 100% collection of C&D waste from the source generation, Preserving existing buildings rather than constructing new ones, Optimizing the size of new buildings.

6. Designing new buildings for adaptability to prolong their useful lives

7. Using construction methods that allow disassembly and facilitate reuse of materials

8. All the open dumping sites of C&D waste need to be rehabilitated, remediated, maintained and monitored over a long period to ensure better environmental parameters meet the standards.

6.2PROPOSED OBJECTIVES OF WORK:

The scope of study is to arrive the bid parameters to call the tenders to appoint the concessionaire to the Concession Period, the Design, Build, Finance, Operate, and Transfer (DBFOT) for establishing the scientific mechanism to carry the primary Collection and transportation of C&D waste from the source generation spots to the secondary transportation of the C&D waste to Processing plants

1. Feasibility of the proposals to call the RFP on PPP Model with 100% concessionaire investment for the capital and O&M cost for the full-length concessionaire period
2. Prepare Business model to find out the financial viability of the project
3. Based on the above scope of the study the following parameters considered to meet the requirements of the report
4. Assessment of the requirement of the vehicles to transport the C&D waste from the source generations spots.
5. Preparation of the capital cost assessment for various vehicles to transport the C&D waste
6. Prepare the O&M cost to operate the vehicle
7. Repayment cost assessments
8. Assessment of expenditure to consider to arrive the rate towards collection and transportation and gain/loss towards the C&D waste
9. Any laws, Regulations based on C&D Waste Management rules shall be reviewed and the same shall be considered in the report

10. The operating hours shall be 4 hours in the morning shift and 4 hours shall be evening shifts.

11. The capital cost of the vehicles: Due to rapid urbanisation, India’s construction sector is projected to grow at a rate of 7-8% over the next 10 years[1] and is likely to become one of the largest contributors to the Indian economy.54.83Crores

12. The assessed tipping fee to be collected by the concessionaire from the source generators shall: Rs. ----- per TPD for the overall distance of 30KM on one side distance.

13. The RFP based on NITI AAYOG standard Documents along with Model Concessionaire agreement is proposed to call under two independent packages shall be called as follows:

The RFP proposed to call for the capital investment of the Rs. 54.83Crores and O&M expenses for the period of 15 years on PPP model with 100% capital and O&M expenses shall be borne the Concessionaire on their own but by meeting the expenses by way of allowing to collecting the tipping fee from the source generators by establishing the mechanism for the collection, transfer and transport the 1750 TDP from the designated spots within 5KM from source generation spots to transfer spots and from the transfer point to the existing processing plant located at Chikkajala and Kannur within 25Km from the transfer points.

6.3Assumptions to be adopted by intending bidders:

Based on the scope of work and objectives, the following assumptions haveto be adopted:

1) Assessment of the construction facilities and demolition activities within BBMP and Bengaluru urban district.
2) The capacity of the vehicles for the primary transportation isto be at 7.5 T GVW capacity hookloaders or any other suitable size and capacity as per the norms.
3) The secondary transportation has be at 28T totaken up with large-size containers which can be carried by GVW Hook loaders.
4) There are 30 divisions within the jurisdiction and it is proposed to have equal requirement of vehicles per 1 division.
5) The C&D Waste collection and transportation vehicles shall cover the area of BMMP and Bengaluru Urban district.

6.4Assumptions:

Chief Commissioner BBMP Shri Tushar Girinath released the official notification dated: to arrange collection, transfer and transportation of C&D waste from the 198 TO 225 wards of BBMP with 30 divisions.

The proposed C&D Waste collection and transportation has to be up to study based on the above-referred notification.

6.5Proposed package

Quantity of the C&D waste: The C&D waste generation has been taken for the purpose of the preparation transport mechanism as well as for the processing is as same as assessed by KSPCB which is 6700 TPD.

The independent package for Collection & Transportation of the C&D waste from the source generation spots by deploying 7.5 T GVW hook loaders with 5.00 Cum Carrying capacity of containers. The total hook loaders of 7.5 T GVW assessed is 43 nos with containers of 5.00 Cum capacity are of 539 nos. These primary transportation hook loaders shall deploy within 5.0 KM radius. The secondary transportation from the transfer point to the processing spot/ dumpsites shall 25.00 KM on onside distance and shall be carried through 28 T GVW hook loaders with 20.00 Cum capacity containers. The requirement of 28 T GVW vehicles shall be 38 nos. with containers of 135 nos.

6.6The summary of the vehicles:

The broad calculations given here are indicative and bidders are required to provide the minimum 43 number of the vehicles for primary transportation and 38 vehicles for secondary transportation as indicated below however more than these numbers can be deployed based on the need to transport the C&D Waste of Bengaluru Urban District jurisdiction waste as per C&D Waste Management rules 2016.

Table 6: Summary of vehicles

S No.	Item Description	Capacity	Quantity
1	Primary Transportation Hook Loaders Containers	7.5 T GVW 5 cum	43 539
2	Secondary Transportation Hook Loaders Containers	28 T GVW 20 cum	38 135

6.7 Conclusions:

1. Proposed to call the RFP to appoint the Concessionaire for a concessionaire period of 15 years on PPP model with 100% Concessionaire investment on capital cost of vehicles 7.5T GVW Hookloader of 43 vehicles, 28 TGVW Hook loader of 38 vehicles for 15 Years by the bidder
2. The BSWML shall establish the Escrow account and collect the cess from the construction activities through BESCOM based on per sq.km. based on per sqm. Basis of plan section for modification /alteration/ renovation/new construction activities.
3. The processing fee shall be paid by BSWML from ESCROW Account to the Concessionaire. The assessed processing fee is only for reference purpose.

CHAPTER 7: LIST OF ANNEXURES

Annexure– I: C&D WASTE MATERIALS CHECKLIST

The following checklist template will be useful when planning to salvage, reuse and recycle demolition materials

Demolition Materials	Comments and Concerns
Air conditioning equipment 1. Computer room packages 2. Mini central systems 3. Window units	CFC
Aluminium: Handrails, other Appliances, white goods	Testing, removal
Asbestos Containing Materials: Insulation, floor and ceiling tile, floor and wall coverings, roofing felt and shingles, wall board, siding, ductwork, adhesives, caulking, putties, taping and speckling compounds.	
Asphalt: Paving Asphalt: Shingles Batteries	
Brass Brick Bronze Cabinets	
Cable: Various Cardboard	
Carpet, padding and backing Cast iron: Radiators, pipes, other Clay tile blocks	
Compressors	
Concrete masonry units Decking: Wood	
Door frames: 1. Wood, metal 2. Heavy vault 3. Thin panel and various Wood, Metal	Non-rated
Ductwork Earth	
Electric switchgear, feeder cables, conduit	
Electrical: Cable, Elevator cabs, machinery, shaft equipment, rails Fabric	PCB
Fiber glass	
Fire suppression equipment Fixtures & fittings: Plumbing Fixtures: Electrical	
Flooring: Carpet Flooring, Wood Fuel storage tanks	
Furniture: Wood, Metal Furniture: Reusable Furniture	Can be re-manufactured

Glass: Interior and exterior, Plate, Wired, laminated	
Glazing compound: Asbestos, lead possible Testing Gutters and flashing	Testing
Gypsum blocks Gypsum board	
Hardwood Hazardous materials Heavy timbers	ACBM
Insulation	
Light fixtures: Decorative, Fluorescent and utility fixtures, Vintage fluorescent, incandescent, Lamps: Fluorescent	Mercury retrieval
Lead: Paint, Roofing, Flashing, Piping Light bulbs	Testing, removal
Marble: Toilet partitions, Walls	
Metal: Brass, Bronze, Cable, Cast-iron, Conduit, Copper	PCB Ballasts
Partitions, demountable panels Partitions: aluminium tracks, miscellaneous framing	
Mirrors	
Paper	

AnnexureII :VOLUME TO WEIGHT CONVERSION

Materials:	Volume *	Weight in Pounds *
MIXED MUNICIPAL SOLID WASTE (MSW)		
MSW, (uncompacted)	One cubic yard	150-300 (225 Average)
MSW, (compacted in truck)	One cubic yard	500-1,000
MSW, compacted in packer truck	3.3 cubic yards	2000 (Average)
C & D; Clean Fill		
Concrete	One cubic yard	860
Asphalt Paving	One cubic yard	773
Brick, Ceramic, Porcelain	One cubic yard	860
Roofing	One cubic yard	731
Wood	One cubic yard	169

ANNEXURES–IIITIPPING FEE & CONTAINERS SPECIfiCATIONS: (source: Toolkit-on-construction-and-Demolition-waste-management-MoHUA& CPCB)

TIPPINGFEESTOBEPAIDBYAUTHORIZEDAGENCYFORDISPOSALOFWASTEAT DESIGNATEDDISPOSALSITES:

C&DWASTEVOLUME ILLUSTRATIVE	RATES (Rs/Container)
Container(<3m3)	90
Container(6m3)	180
Container(9m3)	270
Container(>12m3)	360

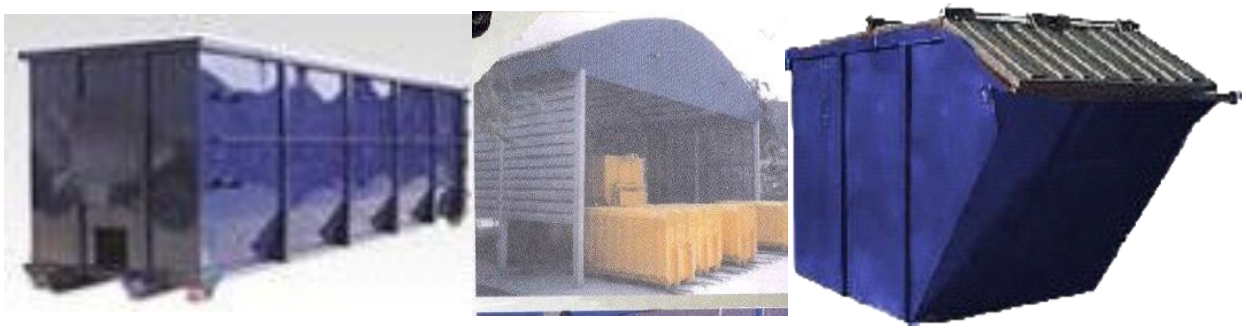
SPECIFICATIONS OF TYPICAL CONTAINERS TO BE USED FOR STORING C&D WASTE

	Model	
ContainerSpecification	HookLoader	DumperPlacer
ContainerType	Closed	Closed
Volume(m3)#	9&12-16	1.5*,2.5-3.5**,4.5-5***
MaterialOfConstruction	CommercialMildSteelofAppropriateISspecification(Notlessthan3mmforwalls/sidesandnotlessthan 4mmforfloor/bottom)	
RecommendedChassis	16-25TGVW	7*,9**,12***TGVW
LiftingArrangement	Rearlifting	Rearlifting

#DimensionsofthecontainerstoadheretotheRTOnorms.Totalloadingnottoexceed25tonnesGVW. The containers shall have integral securement system to ensure that the rear end of thecontaineriswellsecuredwiththevehiclechassis.

ANNEXURE – IV :LLUSTRATIVE PICTURES OF DIffERENT CONTAINERS & VEHICLES

Typical Containers



Typical Hook Lifts

Typical Dumper Placers

ANNEXURE – V: QUANTITY ESTIMATION OF C&D WASTE

Quantity Estimation of C&D Waste:

ThefollowingformulaecanbeusedtoestimatethequantityofC&DWaste

Formula: $A x G_{ave} x 0.000454 = Q_p$

Where,

A=ProjectSquareFootage

G_{ave}=WeightedAverageGenerationRate(ReferbelowTable)Q_p=TotalProjectC&DWaste

0.000454=ConversionFactorfromlbstotons

Weighted Average C&D Waste Generation Rates

S.No	Type	Residential(lbs/sq.ft)	Non-Residential(lbs/sq.ft)
1.	NewConstruction	4.38	3.89
2.	Renovation	Varies	17.67
3.	Demolition	115.00	155.00

(Source:FranklinAssociates,"CharacterizationofBuilding-RelatedConstructionandDemolitionDebrisintheUnitedStates,"U.S.EnvironmentalProtectionAgency,Jun.98,p.2-2,2-3,2-6,2-7,2-8,2-9,2-10,andA-5.)

Annexure-VIC& D WASTE BY PHYSICAL VERIFICATION AT UNAUTHORIZED DUMPSITES AND CCONSRTUCTION & DEMOLITION SITES IN BENGALURU CITY

Sl No	NAME OF THE LOCATIONS	NO.OF SPOTS
1	ORR from Guruguntapalya to Nayandahalli	20
2	Tumkur road from sangollirayanna Circle to 8 mile	6
3	You are from gundu Guntur palya to batrahalli	34

4	Magadi road	10
5	West of chaar road	10
6	Alhasandrakogilo Kannur road	12
7	Hennur Main Road	6
8	BEL Signal to Doddaballapura Road	4
9	Kommaghatta Road`	2
10	Sommanahalli - Mughulpalya	4
11	Bedarahalli – Ullal Road	2
12	Hegganahalli Main Road	6
13	Ring Road – Kantirava Studio Mani Road – MEI Road	2
14	Pipeline Road	6
15	Bengaluru University Road	2
16	Ramanagondanahalli	10
17	Hessaraghatta Road	2
18	HMT Road	6
19	Ganigarahalli Main Road	10
20	Thanisandra Main Road	2
21	MEI Main Road	2
22	GKVK Road	2
23	NadaprabhuKempegowda Main Road	2
24	Attur Layout Road	2
25	Ramachandrapura Main Road	2
26	Kachohalli – Gangondanahalli – Dombarahalli Road	4
27	Andhrahalli Main Road	4

28	Pipeline Road from Goruguntapalya to Hesaraghatta Road	4
29	OMR from KP Puram to Chamasandra	30
30	ORR from KP Puram to Silk Road	18
31	OMR link 2 from KP Puram to Hoodi Junction	14
32	OMR link 1 Trinity Circle to Benniganahalli	36
33	Swami Vivekananda Road	4
34	Old Airport Road	26
35	Suranjan Das Road	24
36	Indiranagar 80 feet Road	16
37	CMH Road	14
38	Paramahamsa Yoganand Road	14
39	Hal Wind Tunnel Road – Belur Yemalur Road	4
40	Hoodi - Hal	16
41	Nallurahalli Main Road	8
42	ITPC Jain school to Whitefeild	6
43	Kensington Road	6
44	Quees Road	2
45	Ventakaswamy Naidu Road	4
46	Commercial Street Road	8
47	Rmamurthy Nagar – TC palya	8
48	ULSOOR lake Road	6
49	St. John Chruch Road	4
50	KR Puram Police station road	10

51	Rammurthy Nagar Kempegowda underpass	2
52	Rammurthy Nagar Main Road (Bridge)	4
53	Kasthurinagar Main Road	6
54	Assaye Road	2
55	ByrathiBilishivale Main Road	10
56	Kalkere to Rammurthynagar	4
57	Kodigehalli Main Road	6
58	ORR from Nayandahalli Junction to Silk Board	10
59	Mysore Road from Hudson circle to Nice Road Junction	16
60	KanakpuraRioad from Nice Road Junction to KIMS Hospital	12
61	Bannerughatta Road to Anepalya Junction to Nice Road	22
62	Hosur Road from Silk Board to Electronic City Nice Road Junction	14
63	Intermediate Ring Road from Hosur Road to OMR VIA Ejipura	20
64	Gandhimarga from Jnanabharathi to KVRV Road 5th Main (Magdi Road)	2
65	New BEL Road from CV Raman Main Road to Kuvempu circle	6
66	Hennur Main Road from Hennur cross to Frazer Town	8
67	MM Road from Frazer town to wheeler Road	4
68	Millers Road from Bengaluru from Contiment to Halsur lake	4
69	Sankey Road from Yashvanthpur Bus Station Kaveri Theater	6
70	Dr. Rajagopal Road to kodigenahalli Main Road Via	6

	Sanjaynagar Main Road	
71	SubrothoMukarji Road from Jalahalli Cross to BEL Junction	2
72	Dr Vishnuvardhan Road to Kengeri Bus terminal to Vishnuvardhan Circle (Uttarahalli)	10
73	Dr Vishnuvardhan Road from Vishnuvardhan Circle (Uttarahalli) to Benniganahalli Metro Station	4
74	100 ft Road Turahalli forest from Gattige Palya to Banashankari 6ht Stage	6
75	Kumaraswamy temple Road to HD DevegowdaCicleVerabhadra Nagar	2
76	Ullal crossto Nice Road	4
77	Basaveshvara Nagar Main Road Havanur Circle to West of Chord Road	10
78	Ambalipura to Sarjapura Road from Sarjapura to mutthanallur Cross	12
79	Banashankari Bus Stop to Mandiwala Ayyappa swamy temple Road	10
80	Gothgere Main Road	2
81	Ullal Bridge to Kengeri satellite town	6
82	Ullal flyover to Magadi Road via Sunkadkatte	10
83	Shivajinagar (Thimaiah Road)	2
84	Shivaginagar (Old poor hourse road)	2
85	Shivajinagar (cock burn road)	8
86	Shivajinagar (Dasappa Colony)	2
87	Halasur lake	10

Annexure-VII ILLUSTRATIVE RATES FOR SERVICE CHARGES FOR ULBs

(Source: Karntaka Policy and Strategy on Management of CD Waste)

S.no	Type of Waste Generator (excluding Bulk Waste Generators)	Service Charges from each Waste Generator to be not less than*:		
		Population > 10 lakhs	Population >= 3 lakhs and < 10 lakhs	Population <3 lakhs
1.	For collection, transportation & transportation of C&D Waste:			
	(i) Upto 5 km of one-waydistance between point of lifting and point of disposal of C&D waste where the vehicle capacity is 15 MT	Rs. 10,000	Rs. 9,000	Rs. 8,000
	(ii) More than 5 km and upto 10 km of one-waydistance between point of lifting and point of disposal of C&D waste for maximum quantity of 15 MT of C&D	Rs. 12,000	Rs. 10,000	Rs. 9,000
	(iii) More than 10 km and upto 20 km of one-waydistance between point of lifting and point of disposal of C&D waste for maximum quantity of 15 MT of C&D	Rs. 14,000	Rs. 12,000	Rs. 11,000
	(iv) After 20 km for maximum quantity of 15 MT of C&D	Suitable pro-rata rate as determined by the ULB shall be applicable.	Suitable pro-rata rate as determined by the ULB shall be applicable.	Suitable pro-rata rate as determined by the ULB shall be applicable.

*These rates are indicative and, in the event, the ULB wants to change the Service fee from the above-mentioned rates due to any reason, it should cover the following costs for the ULB and/or private service provider on an aggregate basis:

Annexure-VIIIESTIMATION OF CDW FROM CONSTRUCTION PROJECTS IN

C&D WASTE DATA from 01.01.2020 to 28.06.2021

Sl. No.	Name & Address of the Projects	Type Of Project	Built Up Area in Sq.m	ACRES
1	M/s. Arvind Smartspaces Ltd., located at Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	57,062.78	
2	M/s. S.V. Housing in the name of "S.V. Grandur" located at Kammasandra Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	41,343.32	
3	M/s. V Group (Residential Apartment) located at , Kowdenahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	21,838.96	
4	M/s. S.S.P Garden City located at Cowdalli Village, Kollegal Taluk, Chamarajanagar District.	Residential Layout	0	32.35
5	M/s. Prestige Estates Projects Ltd., located at Pattandur Agrahara Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,70,752.88	
6	M/s IBC Knowledge Park, located at Bannerghatta Road, Uttarahalli Hobli, Bengaluru South Taluk, Byrasandra, Bengaluru.	Hotel/Office (Block - G)	65040.59	
7	M/s Prithvi Developers located at Varthur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	34,749.60	
8	M/s Metro Cash and Carry India Private Limited., located Industrial Suburbs, Subramanyanagar, Yeshwanthpur, Bengaluru.	Commercial Building	1,77,470.03	
9	M/s. Adarsh Haven Pvt Ltd., located at Gasthikempanahalli Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru Urban District.	Residential Apartment	4,13,164.59	
10	M/s. Sumadhura Homes LLP (Residential Apartment) in the name of "Sumadhura Asphire" located Doddabanahalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District.	Residential Apartment	36,302.65	
11	Sri. Venkateshwara Industrial LLP located at Electronic City 2nd Phase Industrial Area within the Village limits of Konnappana Agrahara, Begur Hobli, Bengaluru South Taluk.	Commercial Building project	1,49,000.03	
12	M/s. Embassy Construction Pvt Ltd., Venkatala Village, Yelahanka Hobli, Bengaluru Urban District, Bengaluru.	"Embassy Business Hub" Commercial Development Projects	88,270.15	
13	Dr D. Premachandra Sagar located at Devarakaggalahalli Village, Harohalli Hobli, Kanakapura Taluk, Ramanagara District.	Hostel Building	56,353.68	
14	M/s. Adarsh Developers located at Gattihalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	6,54,472.72	

BENGALURU

15	Smt. Nagamma & Anoop N Patel (A.A. Builders & Developers) located at Anupinakate Village, Kasaba Hobli, Shivamogga Taluk & District.	Residential Layout		20.14
16	M/s. Eco Life Developers located at Balagere Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	65,516.37	
17	M/s. Felicity Adobe LLP (Formerly Known as Tumkur Nivas LLP) located at Arabikottanoor Village, Vakkaleri Hobli, Kolar Taluk & District.	Residential Apartment	32,331.52	
18	M/s. Akarshak Reality Pvt Ltd., located at Gattihalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	5,67,998.20	
19	M/s. Bagmane Developers Pvt Ltd., in the name of "Bagmane Taurus – 3" located at Sy. No. 58 & 59 of Doddenakundi Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Complex for Office/IT	84,996.02	
20	M/s. Panchajanya Vidya Peeta (PVP) Welfare Trust (Reg.,) Dr. Ambedkar Insitute of Technology located Mallathalli Village, Outer Ring Road, Bengaluru North Taluk, Bengaluru.	Installation of STP to the existing building (Institution Building)	36,000	
21	M/s. Bagmane Developers Pvt Ltd., in the name of "Bagmane Capital" located at Mahadevapura Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Commercial Building	9,20,843.63	
22	M/s. Radiant Kaira located at Kammasandra Agrahara Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	29,573.44	
23	M/s. Golf Links Software Pvt Ltd., located at Challaghatta Village, Off Intermediate Ring Road, Bengaluru.	Existing STP's from FBR Technology		
24	M/s. Christ University located Dharmaram College, Hosur Road, Bengaluru South Taluk, Bengaluru.	Educational Institute	11,342.56	
25	M/s. Bengaluru Development Authority (BDA) located at Konadasapura Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	83,665.15	
26	M/s. Casa Grande Garden City Builders Pvt Ltd., located at Geddalahalli Village & Thanisandra Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	61,687.78	
27	M/s. DSR Infrastructure Pvt Ltd., located at Bidare Agrahara Village and Doddabanahalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Residential Layout	78,179.56	
28	M/s. S.V. Infra Holdings Limited located at Khatha No. 3255, Sy. No. 38, Pattandur Agrahara Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Commercial/Residential Apartment	45,792.23	
29	M/s. Expert Investment Pvt Ltd., located atBukkasagara Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Layout		21.29

30	M/s. Surya Projects located at Channasandra Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District.	Residential Apartment	41,867.15	
31	M/s. APG Industrial Conglomerate Pvt Ltd., located Hitech Defence & Aerospace Park, Devanahalli Taluk, Bengaluru Rural District, Bengaluru.	New Warehouse Building	1,05,463.83	
32	M/s. MVN Infrastructure Pvt Ltd., located at Rayasandra Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District, Bengaluru.	Residential Apartment	58,208.63	
33	M/s. Manipal Academy of Higher Education Trust located at Vasudevapura Village and Govindapura Village & Kenchanahalli Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Construction of Academic Building & Hostel Block	1,44,587.83	
34	M/s. Ahad Builders Pvt Ltd., located at Rayasandra Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	99,957.83	
35	M/s. Desai Developers located at Seeghehalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	44,324.82	
36	M/s. Mac Charles (India) Ltd., located at Vasanthanagar, Bengaluru – 560 052.	Commercial Building	64,657.40	
37	M/s. Munawar Burhan located at Geddalahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengluru.	Residential Apartment	38,222.21	
38	M/s. Bagmane Developers Pvt Ltd., in the name of "Bagmane WTC Opal" located at Mahadevapura Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Building	93,417.24	
39	M/s. Bagmane Developers Pvt Ltd., located at Mahadevapura Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Commercial Building	2,20,724.19	
40	M/s. United Developers located at Nagondanahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	37,764.47	
41	M/s. Gazy Mag Pvt Ltd., located at Chikkagubbi Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	80,237.66	
42	M/s. Green Nesto Builders & Developers located at Chikkanayakanahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	33,546.76	
43	M/s. Manjeera Constructions located at Allalasandra Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	82,025.05	
44	M/s. Urban Space Projects Pvt Ltd., & Others C/o Sobha Limited located at Yadavanahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	1,13,100.34	
45	M/s. Sap Labs India Pvt Ltd., located at KIADB, Export Promotion Industrial Park, Whitefield Road, Bengaluru.	IT/ITES Office Building	79,827.08	

46	M/s. Project Seabird Phase II A, Karwar Naval Base DDGPI, PIMT Office, Naval Base, Arga Village, Karwar Taluk, Uttar Kannnada District.	Naval Base Project		
47	M/s. Expert Investment Pvt Ltd., located at Bukkasagara Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	19,992.83	
48	M/s. Godrej Projects North Star LLP located at Chikkasanne Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Apartment	1,35,031.66	
49	M/s. Sri Sai Associates located at Kaggalipura Village, Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Residential Apartment	66,259.76	
50	M/s. United Infrastructure located at Ammani Bellandur Khane Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	31,590.93	
51	M/s. M. Chandrashekar located at Kithaganur Village, Bidarahalli Hobli, Bengaluru.	Residential Apartment	62,050.27	
52	M/s. 2Getherments Infra Pvt Ltd., located at Khatha No. 866, Hoodi Village, K.R. Puram, Bengaluru.	Residential Apartment	55,979.85	
53	M/s. Sai Raghavendra Constructions & Development located at Pattandur Agrahara Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	40,675.03	
54	M/s. Krishna E Campus Pvt Ltd., located at Ambalipura Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment and Commercial Space	86,840.12	
55	M/s. Shreshta Infra Projects Pvt Ltd., located at Hegganahalli Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Layout	4,01,598.30	
56	M/s. Shreshta Infra Projects Pvt Ltd., Phase – II located at Bettanahalli Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Layout	1,70,675.48	
57	M/s. G.R. Construction located at Rayasandra Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	41,026.42	
58	M/s. M.R. Group located at Singasandra Village, Begur Hobli, Bengaluru.	Residential Apartment	30,651.88	
59	M/s. Century Star located atAttur Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	83,561.87	
60	M/s. Total Environment Constructions Pvt Ltd., in the name of "In That Quite Earth (ITQE) located at Bileshivale Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	4,55,743.32	
61	M/s. Global Edifice Builders located at Iggalur Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru	Residential Apartment	40,336.67	
62	M/s. Greenfinch Projects Pvt. Ltd., located at Chikkanhalli Village, Attibele Hobli, Anekal Taluk, Bangalore Urban District	Residential Apartment	31,741.75	
63	M/s. Puravankara Ltd., located at K.R. Puram Hobli, Old Madras Road, Bengaluru East Taluk, Bengaluru.	Commercial Building	1,20,339.81	

64	M/s. Klassik Enterprises in the name of "Klassik Landmark" located at Junnasandra Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,33,718.17	
65	M/s. Sobha Limited located at Hagadur Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,74,393.68	
66	M/s. Suguna Builders & Developers located at Haligevaderahalli Village, BBMP Rajarajeshwarinagar Zone & Ward (160), Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	32,371.29	
67	M/s. Taj Gvk Hotels & Resorts Ltd., located at Shivanahalli Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Hotel Rooms	38,199.52	
68	M/s. Mythri Builders located at Kodathi Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	56,734.61	
69	M/s. Indus Valley Homes Pvt Ltd., located at Bellandur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	70,169.48	
70	Sri. Balaji Builders located at Kodigehalli Village, K.R. Puram Hobli, Bengaluru.	Residential Apartment	29,065.13	
71	M/s. Vaishnavi Infrastructure Pvt Ltd., in the name of "Vaishnavi Vintage" located atDoresani Palya, Bilekhalli, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Commercial Building	55602.07	
72	M/s. Brigade Enterprises located at Chikkalasandra Village, Uttarahalli Hobli, Subramanyapura Main Road, Bengaluru South Taluk, Bengaluru.	Residential Apartment	65,000	
73	M/s. Vaishno Builders located at Sheegehalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	36,996.65	
74	M/s. Darshita Housing Pvt Ltd., located at Electronic City 2nd Phase, Konappana Agrahara Village, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Commercial Development of IT Office Building	82,984.90	
75	M/s. Jaganmayi Infra Solution Pvt Ltd., located at Bellandur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Development of IT Office Building	1,05,909.62	
76	M/s. Adwitiya Knowledge Park Qs LLP located at Thavarekere Village, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Commercial Complex	80,208.10	
77	M/s. Universal Metro Properties LLP located at Bagalur Village, Jala Hobli, Bengaluru North Taluk, Bengaluru Urban District.	Residential Apartment	1,49,846.37	
78	M/s. Trishul Buildtech & Infrastructures Pvt Ltd., located at Nagavara Village, Kasaba Hobli, Bengaluru North Taluk, Bengaluru.	Commercial Building	65,449.11	
79	M/s. Brigade Enterprises Limited located at Siddapura Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Complex	1,80,000	
80	M/s. Brigade Enterprises Ltd., located at Kurubarakunte Village, Devanahalli Taluk, Bengaluru Rural District, Bengaluru.	Residential Villas	64,107.61	

81	M/s. Godrej Iris Mark LLP., located at Maragondahalli Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	88,543.67	
82	M/s. Bren Corporation Pvt Ltd., located at Kaggalipura Village, Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru.	Residential Apartment	55,720.51	
83	M/s. Bren Corporation Pvt Ltd., located at BBMP R.R. Nagar Zone & Hemmigepura Ward (198), Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Commercial cum Residential Apartment	54,611.83	
84	M/s. Mfar Madhuvan LLP located at Rachenahalli, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Office Building	42,844.43	
85	M/s. Divyasree Infrastructure Projects Pvt Ltd., located at Bellandur Ammani Khane Village, both of Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Mixed Used Development Project	6,88,867.30	
86	M/s. Janaadhar (India) Pvt Ltd., in the name of "Janaadhar Shubha" located at Sy. No. 39/1, 39/2, 40/3 & 42/1 of Medahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	56,088.04	
87	M/s. Rajiv Gandhi Housing Corporation Ltd., located at , Kenchanapura Village, Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Residential Apartment	89,967.07	
88	M/s. Labzone – Electronic City Pvt Ltd., located at Doddathoguru Village, Electronic City, Phase – I, Begur Hobli, Bengaluru.	Commercial Building	94,190.52	
89	M/s. Candeur Constructions located at Kodigehalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	51,901.94	
90	M/s. Century Sheltors Developers Pvt Ltd., located at Amruthahalli Village & Bytarayanapura Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Commercial Building 1, 2, 3 & 4 and a Club House	1,46,385.45	
91	M/s. Subadra Residential Development by M/s. Subadra Textiles Pvt Ltd., located at Magadi Main Road, Agrahara Dasarahalli, Bengaluru.	Residential Apartment	92,442.70	
92	M/s. NVR Developers located at Kumbena Agrahara Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	43,954.08	
93	M/s. Shreno Ltd., in the name of "Alembic City, Whitefield Bangalore located at Kadugodi Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Non Residential IT/ITES Development	2,68,371.24	
94	M/s. Salarpuria Real Estate Pvt Ltd., in the name of "Senorita – II" located at Kasavanahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	37,715.46	
95	M/s. Keya Homes located at Gollahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	70,343.81	
96	M/s. Goel Ganga Realty Pvt Ltd., located at Old Seegehalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,07,316.68	

97	M/s. DS Max Properties Pvt Ltd., in the name of "DS Max Sky Subham" located at Kithaganoor Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	59821.03	
98	M/s. Sattva Developers Pvt Ltd., located at , Bommenahalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	34,187.37	
99	M/s. Brigade Enterprises Ltd., located at Chikkanayakanahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	35,440	
100	M/s. Christ University located at Chokkasandra Village, Yeshwanthpura Hobli, Bengaluru North Taluk, Bengaluru.	Educational Institute/Office/Hostel Building project	1,49,602.14	
101	M/s. Central Industrial Security Force (CISF) located at Lakkur Village, Sompura Hobli, Nelamangala Taluk, Bengaluru Rural District.	Residential & Non – Residential Building	49,203	
102	M/s. Brigade Enterprises located at Dasarahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	79,592.91	
103	M/s. Trinayani Realtors Pvt Ltd., located at Udayagiri Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District.	Mixed Development Project	1,30,019.87	
104	M/s. Mahendra Homes Pvt Ltd., located at Andhapura Village, Chandapura Purasabhe Attibele Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	1,18,337.79	
105	Sri. Akram Ahmed & Smt. Syeda Ayesha Siddiqa located at of Bikkanahalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	40,609.46	
106	M/s. G Corp Homes Pvt Ltd., located at Bengaluru East Taluk, Bengaluru.	Residential Apartment	3,41,359.56	
107	M/s. DNR Corporation Pvt Ltd., located at Yeshwanthpura Village, Yeshwanthpura Hobli, Bengaluru.	Commercial Building	1,07,404.49	
108	M/s. Svp Eco Enviro Solution located at , Jigani Village, Jigani Hobli, Anekal Taluk, bengaluru - 560105	CSTP		
109	L. Vinay, Hosahyadya Village, Kasaba Hobli, Doddaballapura Taluk, Bangaklore Rural District.	Residential Layout	66519.27	
110	M/s. Millennium Habitat Apartment Owners Association., Kundanahalli Village, ITPL Main Road, Next to CMRIT College, KR Puram Hobli,Bengaluru - 560 037	Residential Building		
111	M/s. ITC Limited, No.18, Banaswadi Main Road, Pulikeshinagar, Bengaluru - 560 005	Commercial Office / IT Building	2,25,100	
112	M/s. chikkaballapura Institute of medical Science (Proposed 1000 bedded Hospital 7 Academic Block For medical College and Allied Facilities at Chikkaballapura), Aruru Village Mandikal hobli, Chikkaballapura Taluk & district	Hospital		79.29

113	M/s. TBC Homes Infra Corp, Byagadadenahalli Village, Bengaluru Urban District	Residential Layout	40670.34	
114	M/s.Century Star,Lingadeeragolahalli Village, Kundana hobli, Devanahalli Taluk, Bangalore Rural District.	Residential Layout	94745.7	
115	M/s. NirmayBuilders & Developers LLP and Seven Hills Properties at Chokkahalli Village, Kasaba Hobli, Hosakote taluk Bangalore Rural District	Residential Layout	74,005.85	
116	M/s. Composite housing Scheme phase II by M/s. Karnataka Housing Board,Rayasandra Village, Kanakapura Taluk, Bangalore Urban, Ramanagara district	Residentail Layout	3,57,843	
117	M/s. D.S Max Properties Pvt Ltd.,Medahalli Village, sarjapura Hobli, Anekal Taluk, Bangalore Urban District	Residentail Apartment	33,723.50	
118	M/s. Shri Basaveshwara Veerashiva Vidyavardhaka Sangha, , Abbnakuppe, ittamadu Village, Bidadi Hobli, ramanagar Taluk & District	Educational Institute	53,214.12	
119	M/s. Icon Infra Shelters India Pvt Ltd.,Thindlu Village, Sarjapura Hobli, Anekal Taluk, Bangalore Urban District	Residential Layout		**12.21**
120	Proposed Residential Layout by M/s. Akarshak Reality Pvt Ltd., Ghattahalli Village, sarjapura hobli, Anekal Taluk, Bengaluru	Residential Layout	1,02,904.63	
121	Residential Layout of M/s. Concorde Sylvan View Byappanahalli Village and Maraganahalli Village Kasaba Hobli, Chickaballpura(T) and (D)	Residential Layout	83542.12	
122	Mahindra Lifespace Developers Ltd., BPL Software , Bannergahatta Road, Arekere Villlage Bangalore - 560 076	Residential Apartmernt	9877046	
123	BWSSB, 5 MLD Site No. 86, Singasandra Village & Hobli, ward No. 191, Bengaluru South Taluk, Bengaluru - 560 068	STP		
124	BWSSB, 35 MLD, site No. 36 & 37, Sector IV, HSR Layout, Begur Hobli, ward No. 174, Bengaluru - 560 102	STP		
125	M/s. Rajiv Gandhi Housing Corporation Ltd., Nelaguli Village, Uttrahalli Hobli, bangalore South Taluk, Bangalore Urban District	Residential Apartmernt		
126	M/s. Honnavar Port Pvt Ltd., No.103, Lalehzar Apartment , 45/1-2, Palace Road, Bangalore - 560 001.			
127	M/s. Rajiv gandhi Housing Corporation Ltd., Chikkellure Rampura Village, tavarekere Hobli, banglore South Taluk, bnaglore Urban District	Residential Apartmernt	28,124.28	
128	M/s. Rajiv Gandhi Housing Corporation Ltd., Site Nelaguli village, Uttrahalli Hobli, Bnaglore South Taluk, bnaglore Urban District	Residential Apartment	89,967.70	
129	M/s. Rajiv Gandhi Housing Corporation Ltd., at , Muddayanapalya Village, Tavarekere Hobli, Banglore South Taluk, banglore urban District	Residential Apartment	65,452.43	

130	M/s GSG Realty Residential Layout at , Akkupete Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District	Residential Layout		**24.02**
131	Akarshak Infrastructure pvt Ltd., at Bhoganahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Tech Park	4,19,972.86	
132	DSR Infra Projects., at Chikkakannahalli Village, Chikkakannahalli ,Varthur Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	1,23,242.01	
133	Ressidential apartment by Sri.Arvind S Bhatnagar in the nmae of M/s. Janaadhar South One Projects LLp atCheeluru Village, Maralawadi Hobli, Kanakapura Taluk, Ramanagara District	Residential Apartment	24,303.93	
134	Mount Carmel Educational Society , , Palace Road,Vasanth Nagar, Bangalore - 560 052.	Educational Institute	52,727.69	
135	Godrej Properties Ltd., at Thiruvaranga Village, Anugondanahalli hobli, Hosakote Taluk, Bengaluru Rural District	Residential Layout	2,86,614.61	
136	Manyata Developers Pvt Ltd., Ilthore Village, Kundana Hobli, Devenahalli Taluk, Bengaluru Rural District.	Residential Layout	1,22,061.60	
137	M/s. Gopalan Foundation (Gopalan International Scholl), Sonnenahalli Village, KR Puram Hobli, Bangalore East Taluk, Bangalore	Educational Institution		
138	Prestige Estates Projects Ltd., Panathur Village, Varthur Hobli, Bengaluru	Mixed use Development Project	1,91,778.15	
139	Lowry Memorial College Group of Institutions., at Narayanapura Village, K.R. Puram Hobli, Bangalore East Taluk, Ward No-560 056, Banglore.	Educational Institution	43,611.08	
140	Apg lifestyle Homes Pvt Ltd., Doddajala Village, Jala Hobli, Yelahanka Taluk, Bengaluru	Residential Apartment		15.70
141	Prestige Office Ventures at Gunjur village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Commercial Office	5,19,894.15	
142	Rajiv Gandhi Rural Housing Corporation Limited " Pillahalli Site ", Pillahalli Village, Dasanapura Hobli, Bengaluru North Taluk , Bengaluru Urban District	Residential Apartment	21954.19	
143	Rajiv gandhi Rural Housing Corporation Limited " Agraharapalya Site ", ,Agraharapalya Village, Dasanapura Hobli, Bengaluru North Taluk , Bengaluru Urban District	Residential Apartment	21,665.70	
144	Rajiv gandhi Rural Housing Corporation Limited " Ganigarahalli Site ", , Ganigarahalli Village,Yashwanthpura Hobli, Bengaluru North Taluk , Bengaluru Urban District	Residential Apartment	20,234.28	
145	Residential Layout by Sri. KM Manjunath and sri D Munikrishna., of Byalalu Village, Tavarekere hobli, Bangalore,	Residential Layout	50,483.83	

146	Kanakashree House Building Co Operative Society Limited, Guddimavu Villager, Kengeri Hobli, Bengaluru south Taluk, Bengaluru Urban District	Residential Layout		18.3
147	Karnataka State Police Housing & Infrastructure Development Corporation Limited (KSPH & IDCL) at CA Nagarabhavi 2nd Stage, RR Nagar Zone & Nagarbhavi ward, Nagarbhavi Village, Yashwanthpura Hobli, Bengaluru North Taluk, Bengaluru Urban District	Police Quarters		18.3
		TOTAL	2,48,42,778.56	241.6

ts from 01.07.2021 to 02.08.2022

Sl. No.	Name & Address of the Projects	Type Of Project	Built Up Area in Sq.m	LAYOUTS in Acres & Gunats
1	Apg lifestyle Homes Pvt Ltd., Sy.No. 82/1, 86/1, 86/2, 86/3, 86/4, 86/5(P), 86/6, 87 & 173/2, Doddajala Village, Jala Hobli, Yelahanka Taluk, Bengaluru	Residential Layout		15.17
2	Prestige Office Ventures at sy.No. 190, 191/3, 191/4, 191/5, 191/6, 198/1, of varthur village, varthur hobli, & sy.no. 206/4, 207/6, 207/7, 220/2a, 220/2b, 220/3, 220/4, 220/6, 220/7, 220/9, 220/10, 211/7, 221/2 of Gunjur village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Commercial Office	5,19,894.15	
3	Proposed Residential apartment in the name of GRC infra located at sy.No. 46, Choodasandra Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	40,946.35	
4	Rajiv Gandhi Housing Corporation Ltd., Sy.No. 11, Doddanagamangala Village, Begur Hobli, Ward No. 192, Bangalore - 560 100	Residential Apartment	20,555.36	
5	VR Builders Developers Others, Sy.No. 206, 207/1, 207/2, 207/3, 207/4, 208/1, 208/2, 208/3, Doddahasala Village, Kasaba Hobli, Kolar Taluk & District	Residential Layout		12.16
6	Essenn Infratownship Pvt ltd located at Sy.no. 64/1, 64/2, 65, 66, 67, 68, 69, of Nallenahalli Village, Sy.No. 62/3, 67/5, 75, 74 of Thadur Village and Sy.No. 03, 04, 8/1, 8/2, 8/3, 8/4, 8/5, 8/6, 8/7, 8/8, 8/9, 8/10, 8/11, 8/12, 8/14, 9/1 & 9/2 of nadipinayakanahalli Village, Jangamakote Hobli, Shidlaghatta, Chikkaballapura District	Residential Layout		54.28
7	Brigade Enterprises ltd at Sy.No. 48,50, 51, 52, 53, 54/1A, 54/2, 54/3, 54/4, 56/1, 56/2, 57/1A, 57/1B, 57/2, 58, 59, 61/2, 62, 63, 64, 65/1, 65/2, 66/1, & 66/2, of Kithiganahalli Village, Attibele Hobli, Anekal Taluk and Sy.No. 73/P2, 74/1, 75/1, 84/2, 84/3, 85/1, 85/2, 85/3, 85/4, 86, 87/2, 88, 89/2, 94/1, 94/2, 94/3, 94/4, 94/6, 96, 97, 98, 100 of Banahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District	Commercial Complex	4,73,753.73	
8	Shravanee Propteckh at Municipal No. 287, Plot Nos.4A & 4B, Doddanekkundi 1st Phase Industrial area in Sy.No. 73, Doddanekkundi Village, KR Puram Hobli, Bangalore East Taluk Banglore	Commercial Development	44,264.61	
9	Nambiar Enterprises LLP, Sy No. 128/2, 128/6 Muthanalur Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	49,464.62	
10	D.S. Max Properties Pvt Ltd., Sy No. 100, Bheeman Kuppe Village, Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Residential Apartment	41,448.95	
11	Urban Spaces Projects Pvt Ltd and Others Co Sobha Limited., Sy.No. 51/1(P), 51/2(P), 52/1(P), 52/2(P) & 53, Yadavanahalli, Attibele Hobli, Anekal Taluk, Bangalore.	Residential Apartment	1,54,006.78	

12	Jaganmatha Property Developers Pvt Ltd., Sy No. 10, 11/2, 12/1, 12/2, 15/1 & 15/2, 16/1 to 16/3, 17 of Gullobanahalli & Neeleri Village, Kasaba Hobli, Devanahalli Taluk, Bangalore Rural District.	Residential Layout		249.00
13	Proposed Commercial Office Building Development project in the name of "Prestige Tech Forest" by Sterling Gera Residence LLP at Survey No's. 47/1, 47/2, 47/3, 47/4, 47/5, 47/6 of Varthur Village, Varthur Hobli and Sy. No's. 58, 59/1, 59/2, 59/3, 60/1, 60/2, 62/1, 62/2, 63/3B, 65/1 of Khane Khandaya Village, Varthur Hobli and Sy. No's. 340/2, 340/3, 341/1, 341/2, 341/3, 341/4, 341/5, 342, 343/1, 343/2, 343/3, 344, 345/1, 346, 347, 349 of Ammani Bellandur Khane Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Building	3,44,473.48	
14	Svamitva Landmarks, Sy.No. 60/3, 60/4, 60/6, 60/7, 60/8, 60/9, 60/10, 60/11, 60/12, 95/1, 95/2, 95/3, 95/4, 95/5, 95/6, 95/7, 95/8, 95/9A, 95/9B, 95/10 & 95/12 of Vaderahalli Village, Harohalli Hobli, Kanakapura Taluk Ramanagara District.	Residential Group Housing & Wellness Centre	59,939.51	
15	Sports Authority of India, Bangalore Unviersity Campus Jhana Bharathi Complex, Netaji Subhas Raod, Sy.No. 69 & 77, Nayandahalli Village, Kengeri Hobli, Bangalore South Taluk, Bangalore Urban District - 560 056	Training Institution		74.26
16	Nandi Housing Private Ltd., BBMP Katha No. 51/20/1(20/2)20/P1,20/5, Sy.No. 20/1, 20-P1 & 20/5 of Kammanahalli Village, Begur Hobli, Bangalore South Taluk,Bangalore	Residential Apartment	95,357.43	
17	Lotus developed by sri Chidanand.K.S, Sy nO. 135, 132, 133, 134, 135, 136 & 137 of Kenjiganahalli Village, Madhure Hobli, Doddaballapura Taluk, Benagluru Rural District.	Residentail Layout	50,888.51	
18	Dr.M.C. Sudhakar, Sy.No. 18/4, 19/2, 19/3, 19/4, 19/5, 19/6, 19/7 & 19/8 of Kannampalli village, & Sy.No. 3/1, 3/2, 3/4, 3/5, 3/7, 3/8, 3/9, 4, 41/1, 41/2, 41/3, 41/4, 41/5 & 41/6 of Vadaganahalli Village, Kasaba Hobli, Chinthamani Taluk, Chikkaballapura	Residentail Layout	92297	
19	Platinum Narya Infra at Sy.No. 191, of Kannamangala Village, Biodarahalli Hobli, Bangalore East Taluk, Bangalore - 560 067	Residential Apartment	28,268.99	
20	Godrej Properties Limited located at Sy. No. 77, 175/1, 175/2A, 176/2A, 176/2B & 177 Kodathi Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	1,43,404.38	
21	Mr. R. Shankarappa located atBBMP Khatha No. 340/54, Sy. No. 54, Kenchanahalli Village, BBMP R.R. Nagar Zone, Heemmigepura Ward (198), Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Resdential Apartment	53188.14	
22	DS Max Realty Pvt Ltd., located at Sy. No. 99/2 & 100/1 of Madiwala Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District.	Resdential Apartment	27,475.97	
23	MSR Tech Zone located at Sy. No. 147 of Munnekolalu Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Building	77,562.27	
24	Goyal Hariyana Developers located at Khatha No. 2990/58/70/1 & 70/2, Sy. No. 70/1, 70/2 of Balagere Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	66,778.87	

25	Darshitha Southern India Happy Homes Pvt Ltd., located at PID No. 10-1-42, Municipal No. 42, Site No. 11/1, 12, 12/1 & 13 of Yeshwanthapura – Industrial Suburb, Rajajinagar, Bengaluru.	Commercial Building	1,98,416.51	
26	Smt. Rashmi Kiran located at Sy. No. 69/1, 69/3, 69/4, 69/5, 69/6, 69/7, 69/8, 70, 72/1, 72/3 of Malarabanvadi Village, Kasaba Hobli, Nelamangala Taluk, Bengaluru Rural District.	Residentail Layout		13.2
27	Brigade Enterprises Ltd., located at Sy. No. 64/1B & 74/2A of Chikkallasandra Village, Uttarahalli Hobli, Subramanyapura Main Road, Bengaluru South Taluk, Bengaluru.	Resdential Apartment	30,618	
28	Abhee Developers located at Sy. No. 34/2B1, 34/5, 34/6 & 34/7 of Mullur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	37,009.18	
29	Sekhar Builders & Infratech Pvt Ltd., located at Sy. No. 80/1, 80/2 & 80/4 of Dommasandra Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	45,524.58	
30	Total Environmental Building Pvt Ltd., located at Sy. No. 355, Bettahalasur Village, Jala Hobli, Yalahanka Taluk, Bengaluru Urban District, Bengaluru.	Commercial Complex	60,072.53	
31	Sobha Limited located at Sy. No. 35/3(P), 35/4(P), 37/1, 37/2(P), 38/1, 38/2(P), 38/1, 38/2(P), 38/4(P), 38/5, 79(P), 80/1, 80/2(P) & 80/3(P) Hosakerehalli Village, BBMP Rajarajeshwarinagar zone & Ward No. 160, Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru.	Resdential Apartment	87,085.23	
32	Total Environment Building Systems Pvt Ltd., located at Sy. No. 226/2, 227/1, 227/2, 228/1, 228/2, 228/3, 229, 230/1, 230/2, 230/3, 230/4, 230/5, 230/6, 231/2, 231/3, 239/2B, 240/1, 240/2, 241, 242/1, 242/2, 244/2, 245/1, 245/2, 246/(P), 353, 354/1A, 354/1B, 354/2 & 355(P) of Bettahalasur Village, Jala Hobli, Bengaluru North Taluk, Bengaluru.	Residential Villas	94,398.72	
33	Sobha Limited located at Sy. No. 49/4, 49/7, 50/2(P), 50/3(P), 50/4(P), 51/1(P), 51/2B1 & 51/2B2 of Balagere Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	1,06,722.47	
34	Sri. K.N. Bore Gowda located at Sy. No. 15/3, 16/2, 17/1A(P), 17/3(P), 18, 19/1, 19/2, 20, 21/1, 21/2, 22/1, 22/2, 23, 24/1, 24/2, 24/3, 24/4, 25/1, 25/2, 25/3, 25/4, 25/5 & 25/6 of Kolure Village, Tavarekere Hobli, Bengaluru South Taluk, Bengaluru.	Residentail Layout		14.27
35	Sobha Limited located at Sy. No. 47/1B & 47/2B of Kyalasanahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	82,793.98	
36	Vajram Estates Pvt Ltd., (Vajram Newtown) located at Sy. No. 58, 60, 61/1 & 64/1 of Chokkanahalli Village (Thanisandra Main Road), Yelahanka Hobli, Bengaluru North Taluk, Bengaluru Urban District.	Resdential Apartment	65,402.86	
37	Shankeshwar Landmarks LLP located at Sy. No. 54/1 & 54/2 of Haralkunte Village, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Residential Apartment	89,640.10	
38	Bricks & Milestones Projects LLP located at Sy. No. 25/1, 26/1, 26/2, 27/4, 27/6, 31/1, 31/2, 31/4, 31/5, 31/6, 31/7, 63(P), 64 of Kada Agrahara Village, Sarjapura Hobli, Anekal Taluk, Bengaluru.	Residentail Layout		19.07

39	Bricks & Milestones Projects LLP located at Sy. No. 21/2, 12/3, 139/1, 139/2, 15/1 of Sompura Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	71,477.39	
40	Cosmos Realty & Leisure Pvt Ltd., located at Sy. No. 64(P), 65(P), 67/3, 67/4, 68/3, 68/4, 69/1, 69/2, 69/7, 69/8, 73/P4, 74/2, 74/3, 75, 76, 78/2, 79, 80, 81, 82/1, 83, 66/2 & 82/2 of Bettenahalli Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural.	Residentail Layout		44.33
41	Bren Corporation located at Sy. No. 23/1A, 24/1A, 24/1B & 24/2A of Bandapura Village, Bidarahalli Hobli, Old Madras Road, Bengaluru East Taluk, Bengaluru.	Residential Apartment cum Commercial Building	89,070.30	
42	Primco Realty Pvt Ltd., at BBMP Khata No. 871/902/954/11, Sy.No.11(P), Ambalipura Village, Varthur Hobli, Bengaluru South Taluk, Bengaluru Ward No. 150	Commercial Building	31070.03	
43	Talreja Realty located at Khatha No. 1305/10/2, Sy. No. 10/2, Jakkur Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	35,011	
44	Grand Hills Developments Pvt Ltd., Sy.No. 35/2,35/4, 35/13, 45/2 to 45/10, 46/2 to 46/7, 48/3 to 48/6 & 49/2 to 49/6 of Kadiganahalli Village, Jala Hobli, Bengaluru North Taluk, Bengaluru	Residential Apartment	61,170.14	
45	Felicity Adobe LLP, Sy.No. 214/2, 215/1, 216/8, 216/9, 216/10, 216/11, 216/12, 216/13, 216/14, 216/15A, 216/15B, 216/16A, 216/18, 216/19, 216/20, Kakati Village, & Hobli, Belgaum Taluk & District	Residentail Apartment	1,04,254.25	
46	Azim Premji University, Sy.No. 53, 54, 58, 59, 60/1, 60/2, 60/3, 60/4, 60/5, 62, 79/1, 78/2, 62, 64/1, 64/2, 68, 69/1, 69/2, 70/1, 70/3, 71/2, 72/2, 73, 76/1, 77, 70/2, 79/2, 79/3, 79/4, 67, 72/3, 59, 72/1, 62, 66, 65, 71/2, 76/1, 53, 58, 77, 76/9, 49 & 48/2, Buragunte Village, Sarjapura Hobli, Anekal Taluk, Bengaluru	Educational & Residentail	2,48,389.47	
47	Proposed layout by Smt.Darshana Devi Goyal & Mrs. Urmila Devi Goyal, Sy.No. 51/1, 51/2, 51/3, 51/4, 52/1, 52/2, 52/3 & 54 Kanivenahalli Village, Kasaba Hobli, Malur Taluk, Kolar District	Residential Layout		17.15
48	Sanjeeveni Srusthi Infra, Sy.No. 34/1, Kacharakanahalli Village, Jadegenahalli Hobli, Hoskote Taluk, Bengaluru Rural District	Residential Apartment	44,056.65	
49	India Heritage Trust & Iskon Charities, Sy.No. 39/1, 39/2, 47/1, & 47/2 of Vasanthapura Village, 55/1, 55/2, 56, 57, 58, 59 & 60(P) of Doddakalasandra Village Uttrahalli Hobli, Bengaluru South Taluk Bengaluru	Residential Apartment & Commercial Complex	8,54,669.92	
50	S & M Developers at Sy.No. 47/1, 47/4(Old Sy.No. 49/6) of Balagere Village, Varthur Hobli, Bengaluru	Residentail Apartment	48,387.16	
51	Devas Global Services LLP, Sy.No. 40/1, 41/1, 41/4, 41/5, 42/1, 42/3, 44/1, 44/2, 44/3, 44/4, 44/5, 61/1, 61/2, 62, Kadiganahalli Village, jala Hobli, Bengaluru North Taluk, Bengaluru	Commercial Office Space	2,94,993.40	
52	Residential Layout by Reddy Veeranna Construction Pvt Ltd., Sy.Nos 57,58,59,60,61/6 & 61/7, Gudnahalli Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District	Residential Layout		29.2

	Taluk, Bengaluru Urban District			
54	Sipani Properties Private Limited., Sy.No. 170/1, 171/1, 171/2A & 171/2B, Madivala Village, Kasaba Hobli, Anekal Taluk, Bengaluru - 560 099	Residential Apartment	49,386.21	
55	Artismo El-Nido., Sy.No. 77/3A, 77/3B, 77/4, 77/5, 77/6, 77/7, 77/9, 77/45, 77/16, 77/17, 78/8, 78/10A1, 78/10B of Chikkajala Village, Jala Hobli, Bengaluru North Taluk Bengaluru	Residential & Commercial	56,683.97	
56	Emerald Haven Development Limited, at Sy.No. 117/1 of Singasandra Village, 63/2, 63/3, 63/4, 63/5, 63/6 of Basapura Village, Begur Hobli, Bengaluru South Taluk, Bengaluru - 560 068	Residential Apartment	82,130.16	
57	Sri Balaji Lakeview at Sy.No. 34(P), 35/1(P), 35/2(P), 39/1(P), 39/2A(P), 39/2B(P), 39/3, 40/1(P), & 42 Byalakere Village, Hesaraghatta Hobli, Bengaluru North Taluk, Bengaluru Urban District - 560 090	Residential Layout	56,048.45	
58	Jai Infrastructure at Khata No. 442, Sy.No. 75/2 & 92/6 of Hoodi Village, K R Puram Hobli, Bengaluru East Taluk, Bengaluru - 560 048	Residential Apartment	30,818.10	
59	Soahan Serenity, Sy No. 2/1, 2/2, 3/1, 4/1, 4/5, 4/6, 4/7, 31/1, 31/2, 31/4, 33/1, 33/2, 33/3, 33/4, 34/1, 34/2, 34/3, 34/4, 34/5, 35/1, 35/2, 35/3, 35/4, 35/5, 35/6, 36/1, 36/2, 36/3, 36/4, 36/5, 36/6, 36/7, 36/8, 37/3, 37/4, 37/5, 37/6, 37/7 of Appajipura Village & 36/2A and 36/3 of Mallasandra Village, Hoskote Taluk, Bengaluru Rural District.	Residential Layout	121608.14	
60	Smt V Ramani, Sri. G Ravi & Sri V Rakesh at Khatha No. 1746, Sy.No. 76/5(Part), 76/5B, 76/5C, 77/1(Part), 77/3A(Part), Gunjur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	77,874.10	
61	Mista Infra Pvt Ltd., at Sy.No. 2/6, of Konadasapura Village, Bidarahalli Hobli, Bengaluru East Taluk	Mixed use Development Project	91,281.26	
62	R K Developers at Sy.No. 42, 43/1, 43/2, 43/4, 44/1, 44/2, 44/3, 45/1, 64/1 & 64/2 Chikkadasarahalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Layout		16.12
63	**Residential Layout by Manyata Developers Pvt Ltd.** at Sy.No.6/1, 6/2, 6/3, 7/1, 7/2, 7/3A, 7/3B, 8/3, 9/1, 9/7, 10/7, 10/8, 53/2, 53/4, 53/17, 53/20, 53/21, 55/3, 55/4, 55/5, 55/6, 57/1, 57/2, 57/3, 58/2, 58/3 & 59/3 Ilthore Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Layout		30.6
64	**Sai Sravanthi Infra Pvt ltd** at Sy No.23, 22, 21/1, 21/2, 21/3, 124 & 125 of Seegehalli village, Bidarahalli Hobli Bengaluru East Taluk, Bengaluru.	Mixed use Development Project	3,44,603.80	

65	**Proposed Housing Scheme in the name of "Karnataka Housing Board"** at Sy No. 101, 140/3, 141, 142, 143, 144/1, 144/2, 145, 146, 147, 148, 149, 153, 156, 157, 158, 159/1, 159/2, 160/2, 160/3, 161, 162, 163/1, 163/2, 164, 165, 171/1, 171/2, 172/1, 173, 177, 178, 179/1, 179/2, 180, 181, 182, 183, 184, 185/2, 186, 192, 193, 194, 195, 196, 197, 198, 200, 201, 202,2, 203, 204 of Bellikere Village, Anugondanahalli Hobli, Hoskote Taluk, Bengaluru Rural District.	Residential Layout	3,14,235.78	
66	**Residential Layout by Sri Jawahar Doreswamy & Sri Ajoy Kumar** at Sy.No. 13/4A, 14/1, 14/4, 14/5, 14/6, 14/7, 14/8, 14/9 & 15/1, 15/2, 15/3, 15/4, 15/5, 15/6, 15/7A, 15/7B, 15/8, 15/10, 16/1, 16/2, 17/5, 17/6, 17/7, 17/8, 17/9, 17/10, 20/1 & 20/2 of Doddabele Village, Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District, Bengaluru.	Residential Layout		30.25
67	Sri Shravanth P in the name of Modern Spaces Sy.No. 39 & 40/2 Kadaagrahara Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	62,206.97	
68	H Gopala Reddy Sy.No. 1/1, 3/1, 3/2, 3/3, 3/5, 4/2, 15/1, 15/2, 15/6, 15/7, 16/2, 16/3, 16/4A, 16/4B, Agrahara Village Yelahanka Hobli, Bengaluru North Taluk, Bengaluru	Residential Layout		22.8
69	Casa Grande Garden City Builders Pvt Ltd., located at Sy. No. 1 & 56, Doddabettahalli Village, Yelahnka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	54,078.72	
70	**Residential Layout by Terracon Infra,** Sy No. 34, 35/1, 36, 39/3, 39/5, 41/1, 42/2, 45/1, 47/1, 2 & 3 of Anagalli Village, Srirangapatna Taluk, Mandya District.	Residential Layout		22.31
71	JR Housing Developers Private Limited., Sy.No. 89/2, 89/9, 89/10, 89/11, 90/1, 90/4, 90/6, 90/8, 90/10, 90/11, 90/12, 90/13, 90/14, 90/15, 90/16, 90/17, 90/18, 90/19, 90/20, 90/21, 90/22, & 90/22 & 97/1A of Jinnagara Village, Jadigenahalli Hobli, Hoskote Taluk, Bengaluru Rural District	Residentail Layout		23.38
72	Mantri Infrastructure Pvt Ltd., No. 1, 2nd Main Sampige Road, Malleshwaram, Bengaluru - 560 003	Mixed use Development Project	1,95,519.49	
73	Mantri Garden View Homes Pvt Ltd., Mantri Blossom, New Municipal No. 69, Old PID No. 48-55-69, New PID No. 118-MO 116-106-1, No. 69, Lalbagh Fort Road, sudhamanagara Bengaluru - 560 002	Residential Apartment	83,266.57	
74	Residential Layout By Smt Kousalya Devi Baldawa at Sy.No. T.S No. 1077B, Bandihatti, Cowl Bazar, Ballari District, Karnataka	Residential Layout		14.20
75	Delta Electronics India Pvt Ltd., Plot No. 69-B, 69-C & 69-D, (Sy.No. 56 & 57 of Bommasandra Village), Bommasandra Industrial Area, Hosur Road, Attibele Hobli, Anekal Taluk, Bengaluru - 560 099	Software Units	81,402.76	
76	Sai Kiran Constructions at BBMP Khatha No. 2390/55/1655/2, Sy.No. 55/1, Uttrahalli Village, Uttrahalli Hobli, BBMP Uttrahalli Ward 184, Bengaluru South Taluk, Bengaluru Urban District	Residential Apartment	35,595.29	
77	Mantri Infrastructure Pvt Ltd., No. 41, Vittal Mallya Road, Bengaluru - 560 001	Residential Apartment	1,95,519.49	

78	Mantri Garden View Homes Pvt Ltd., No. 41, Vittal Mallya Road, Bengaluru - 560 001	Residential Apartment	83,266.57	
79	GK Builders Sy.No. 149/1, 150/1, 150/2, 150/3, 150/4, 150/5, 170/1, 170/2, 170/3, 170/4, 170/5, 170/6, 170/7, 170/8, 170/9, 170/10, 170/11, 171/1, 171/2, 171/3, 171/4, 173/P of Kundana Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District	Residential Layout		21.14
80	Ds Max Properties Private Limited, at Sy. No. 76/10,Medihalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	15,802.39	
81	Adrash Nivas Private Limited, Sy.No. 60/1, 60/2, 60/3, 60/4P, 61, 111/1, 111/2, 111/6, 112/1, 112/2, 122/1, 122/2, 122/3, 123/1, 123/2, 123/3, 123/4, 126/1, 126/2, 126/3, 127, 128P, 129/P, 130/1P, 131/1, 171, 172, 173, 174, 175, 176, 177 of Huttanahalli Village Jala Hobli, Bengaluru North Taluk, Bengaluru	Residential Villas	11150.87	
82	Hebbal Infrasapce Private Limited, Sy No. 107/1(P), 116/1, 117/3(P), 118/1(P), 118/2(P), 119/1, 119/2, 119/3(P), 119/7(P), 122/1, 122/2 of Amruthahalli Village and Sy No. 18/1(P), 18/6, 18/7, 18/8, 18/9, 19/1(P), 19/4(P), 19/5(P), 19/6(P) of Byatarayanapura Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru Urban District	Commercial Building	1,47,596.14	
83	Sri. D Kantha & Sri Dinesh Kumar Jain at BBMP Khatha No. 368/Sy.No. 3/2C, & 17/229/17/1 & 2/3/3A2.3/3C2/17,2B.17/1 & 2/17/2B, Sy.No. 3/2C,3/3C2, 3/3A2, 17/2B & 17/112, Ganakalli Vullage, Uttrahalli Hobli, BBMP Hemegapura Ward (198), Bengaluru South Taluk, Bengaluru Urban District	Residential Apartment	51,574.72	
84	Dai Doron India Properties Private Limited., at Sy.No. 173/1, 174, 175/1, 175/2, 175/3, 175/4, Bukkasagara Village, Jigani Hobli, Anekal Taluk, Bengaluru	Residential Layout		16 A 20.75 G
85	TBC Home Infra Corp, Sy.No. 73/2, 74/4, 76, 77/1, 77/2, 77/3, 77/4, 77/5, 77/6, 77/7, 78/3, 78/4, 79/1, 79/2, 79/3, 80/1 & 80/2, Bhyagadadenahalli Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District 562 125	Residential Layout	67,708.02	
86	Jeevan Developers at Sy.No. 95/3, 95/4, 95/5, 95/12 & 95/13, Sheegehalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	54,938.72	
87	Trifecta Projects Pvt Ltd., at Sy.No. 7/1, 7/2, 7/3, 8/1P, 8/3, 9/2, 9/3, 9/4, 9/6(old 9/5) & 11/2 of Jyothipura Village, Bidarahalli Hobli, Bengaluru Esat Taluk, Bengaluru	Residential Layout		11.22
88	DSR Infrastructure Pvt Ltd., at Sy.No. 70 & 71 (New Sy.No. 319/1 & 319/2) of Gunjur Village, Varthur Hobli, Bengaluru	Residential Apartment	42,234.83	
89	Total Environmental Habitat Pvt Ltd., Sy.No. 175, 172/1, 170/1A, 170/1B, 170/2, 172/2, 169/1,2,3,4, 176/3, 177,136/2 & 137 of Hoodi Village, KR Puram Hobli, Bengaluru East Taluk	Mixed Used	5,92,346.00	
90	Akshay Enterprises, Sy.No. 12/4, 12/7(p), 12/9, 15/1, 15/3, 16/1, 16/2, 16/3, 17/6 & 17/9 of Chikkabellandur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Residential Layout		20.06

91	HAL	Residential Apartment/quarters	57,696	
92	KUL Urban Development Private Limited at Sy.No. 35, 44, 45, 46, 47 & 48 of Gangasandra Village, Kengeri Hobli, Bengaluru South Atluk, Bengaluru Urban District	Residential Layout		29.24
93	Residential Apartment Building Project by Saritha Developers at Sy.No. 43/1 & 43/2 of Gunjur Village, Varthur Hobli, Bengaluru.	Residential Apartment	55,210.22	
94	Jain Heights & Structures Pvt Ltd., No.2, Souls,2nd Floor, 1st Cross, J.C.Road, Bengaluru - 560 002	Residential Apartment	43,726.20	
95	Casa Grande Garden City Builders Private Limited., Sy.No. 15, Srinivaspura Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru	Residential Apartment	85,905.62	
96	Garudachala Estates Private Limited at Khatha No. 886/35/186, Sy.No. 35/3 of Medahalli Village, Bidarahalli Hobli, Bengaluru East Taluk	Residential & Commercial	47159.94	
97	SBR Infra Buildtech, at Sy.No. 121/2, 121/5, 121/6, 121/7 & 122/1 of Seegehalli Village, Bidarahalli Hobli, Bengaluru East Taluk	Residential & Commercial	1,31,232.62	
98	Iconica Projects, at Sy.No. 5/1, 5/2, 7/2, 7/3, 10/2, 44/2, 44/5, 45/2C, 46 & 47 of Manchanalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	2,44,807.00	
99	Information Technology Park Limited (ITPL), Sy.No. 80, 83, 85 & 86 of Sadaramangala Village & Sy.No. 113/1, 113/2, 114/1, 114/3B, 116, 117, 118, 119, 110/2, 111/2, 115/1, 115/2, 115/2, 115/3 & 114/3A of Pattandur Agrahara Village, all of KR Puram Hobli, Bengaluru East Taluk, Bengaluru - 560 066	Software Units	1,31,970.00	
100	Proposed Composite Housing Scheme Suryanagar Phase II Sy.No. 49, 5/4P, 6/1, 7, 8/1 to 196/1 to 3 of Hinnakki Village, Jigani Hobli, Sy.No. 380/1, 389 to 396 & others of Marasur Village, Kasaba Hobli, Sy.Nos 7, 12, 128 & Others of Lingapura Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District	Residential Area	30,56,905.26	
101	Elite Estates, Sy.No. 135/1, 136/1 Ofd Gokare Village & 258/1, 258/2, 258/3, 259/2, 260/1, 260/2, 274/1, 275/3 of Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District	Residential Layout		14.28
102	Ruchira Developers LLP & Sri Lakshmi Venkateshwara Infra LLP at Sy.No. 188 & 189, Kannamangala Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	70,369.03	
103	Aratt Centrum at Sy.Nos 67/3 & 67/4, Maragondanahalli Village, Jagani Hobli, Anekal Taluk, Bengaluru Urban District 560 099	Residential Apartment	48,764.74	
104	Smt R Ashwathalakshmamma at Sy.No. 148/1, 148/2, 190/2, 197/2, 200, 201/1, 201/2, 201/3, 201/4, 201/5 of Sreegiripura Village, Kuduru Hobli, Magadi Taluk, Ramangara District	Residential Layout		19.35
105	Janaseva Trust Sy.No. 16, Chennenahalli Village, Tavarekere Hobli, Magadi Road, Bengaluru South Taluk, Bengaluru Urban District 562130	Commercial Building	1,03,367.18	
106	**United Projects Suncity at Sy.No. 3/1A3, 8/5, 9/7, 30/3 of Sadaramangala Village, KR Puram Hobli, Bengaluru East Taluk,**	Residential Apartment	62,054.70	

107	Sri. K.N.Avalappa, Smt.Pankaja & Sri Y.N.Honnaraja at Sy.No. 154/8, 154/22, 154/32, 154/33, 154/34, 154/35, 154/35, 154/36, 154/37, 354/38, 154/39, 154/40, and 154/41 of Tavarekere Village, Tavarekere Hobli, Bengaluru South Taluk, Bengaluru Urban District	Residential Layout		16.27
108	Sri Pradeep Krishnappa S/O M Krishnappa at Sy.No. 89, 90, 91/1, 91/4 & 91/6 of Ajjanahalli Village & Sy.No. 62/7, 63/39 & 63/59 of Hullavanahalli Village, Tavarekere Hobli, Bengaluru South Taluk, Bengaluru Urban District	Residential Layout		11.14
109	Sri Srinivasa Educational & Chaitable trust, Sy.No. 8/2, and 14/5A, Khata No.4, Chikkasandra Village, Yeshwanthapura Hobli, Bengaluru North Taluk, Bengaluru Urban District	Commercial Building	117884.42	
110	Puravankara Limited, Municipal No. 74, PID No. 32-1-74, Magadi Main Road, New Ward No. 122, Kempapura Agrahara, Bengaluru 560 023	Residential Apartment	67106.71	
111	**DS Max Properties Private Limited,** at Sy.No. Sy.No. 58/5, Bendiganhalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	18,292.29	
112	**United Infrastructures** at Sy.No. 6/4, 6/3 of Sadaramangala Village, KR Puram Hobli & Sy.No. 40/5 of Kumbena Agrahara Village, Bidarahalli Hobli, both of Bengaluru East Taluk, Bengaluru Urban District.	Residential Apartment	62,054.70	
113	**Atco Infrastructure Private Limited,** at Sy.No. 68/1, 68/2, 68/3, 71, 72/3, 72/5 & 73/3, Handenahalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban Dsitrict	Residential Apartment	1,28,925.70	
114	Casa Grande Garden City Builders Pvt Ltd., Sy.No. 50, Haralakunte Village, Begur Hobli, Bengaluru South Taluk, Bengaluru - 560 068	Residential Apartment	53,124.98	
115	Upakar Residences Private Limited, at SY No. 53/1, 64/2 & 67 of Indlabele Village, AttibeleHobli, AnekalTaluk, Bengaluru Urban District..	Residential Layout		**11.07**
116	United Developers at Khata No. 1119, Sy.No. 113/1, 133/2 & 113/6 of Nagondanahalli Village, K.R.Puram hobli, Bengaluru	Mixed Used Development	43,410.38	
117	S2 Homes, at Sy.No. 397/2 of Sarjapura Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	23,570.20	
118	M R Infra Sy.No. 51/3, 52/1, 56/1, 56/2, 57/1, 57/2, 60/3, 60/4, 62/3 7 62/4 of Dharapura Village, Kasaba Hobli, Ramangaram Taluk & District	Residential Layout		16.19
119	Dr Shivaram Karanth Layout Scheme., by varoius Sy.Nos of Varoius Villages, yelahanka hobli, Bengaluru north taluk, bengaluru urban district	Residential layout		3,546.12
		TOTAL	**1,27,14,279.36**	**4417.83**

BENGALURU C&D WASTE GENERATION DATA FROM 1.1.2020 TO 31.7.2022

NO	PARTICULARS OF BENGALURU	TOTAL BUIT UP AREA IN SQ MT.	LAYOUTS IN ACRES	C&D WASTE GENERATED IN TONNES
1	Data of Consents accorded 1.1.2020 to 31.7.2022 (30 Months) by KSPCB	3,75,57,057.91	4629.6	2810943.11
2	Smaller projects less than 175 Flats or less than 2.75 L SFT (considered as 50% of above, as they are more in mumber)			1405471.56
3	Demolition of buildings (can be considered 10% of the total buit up. Example one Le Meridian Hotel demolished a 10 Lakh SFT of building)			421641.47
4	The public works, metro and smaller independent repair and demolition at 50% of the major projects			1405471.56
5	TOTAL C&D WASTE GENERATED IN 30 MONTHS			6043527.70
6	AVERAGE TONS OF C&D GENERATED PER MONTH			201450.92
7	**AVERAGE TONS OF C&D GENERATED PER DAY**			**6715.03**